COMPREHENSIVE HATCHERY MANAGEMENT PLAN

Dworshak National Fish Hatchery
Planning Report: Number #
April 2004

U.S. Fish & Wildlife Service

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Dworshak National Fish Hatchery

Planning Report: Number

Prepared by

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U.S. Fish and Wildlife Service, Region One

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Explanation of Purpose

Dworshak National Fish Hatchery – Comprehensive Management Plan

This Comprehensive Hatchery Management Plan (CHMP) for the Dworshak National Fish Hatchery (NFH) is an operational management plan which outlines policy, legal mandates, goals and objectives relevant to the overall management of the station. This document is a planning and reference tool and is not a decision-making or policy-making document.

Additional documents developed in separate processes are referenced in this CHMP and provide biological, policy, legal, and management analysis of the Dworshak NFH. These documents are the Biological Assessment and Biological Opinion on Artificial Production in the Columbia River Basin, the Federal Columbia River Power System Biological Opinion, the Hatchery and Genetic Management Plan, and the U.S. v Oregon Columbia River Fisheries Management Plan.

The correct citation for this plan is:

U.S. Fish and Wildlife Service (USFWS). 2003. Comprehensive Hatchery Management Plan for the Dworshak National Fish Hatchery. Planning Report Number , U.S. Fish and Wildlife Service, Dworshak National Fish Hatchery, Ahsahka, Idaho.

This Comprehensive Hatchery Management Plan for the Dworshak National Fish Hatchery (Planning Report: Number 2) addresses the Pacific Region's requirement to integrate U.S. Fish and Wildlife Service objectives and priorities with those of co-managers, other agencies, and resource programs; fulfill obligations under the Endangered Species Act and relevant fisheries conservation, mitigation, and management programs; identify and define in specifics what hatchery reforms are implemented to achieve objectives; and, provide a foundation for future program and budget development and review.

Submitted by:

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Acknowledgments

Dan Diggs and Doug DeHart coordinated the initial development of this plan, along with Chuck Dunn, Lee Hillwig, Ed Forner, Kate Benkert, Bob Semple, Larry Marchant, Ed Lamotte, Bob Wunderlich, Ron Wong, Doug Olson, Brian Cates, and Rich Johnson. Kelly Gardner, administrative assistant at the Dworshak Fishery Complex assisted with typing and document preparation and compilation.

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EXECUTIVE SUMMARY

Plan Overview

The U.S. Fish and Wildlife Service (Service) recognizes the need for a comprehensive hatchery planning process to meet the present day and future fishery management challenges of conserving Pacific salmon and other anadromous and freshwater fish species. The development of these plans will help to: 1) integrate Service objectives and priorities with those of co-managers, other agencies, and resource programs; 2) fulfill our obligations under the Endangered Species Act and relevant fisheries conservation, mitigation, and management programs; 3) identify and define in specifics what hatchery reforms we are implementing to achieve our objectives; and, 4) provide a foundation for future program and budget development and review. This plan recognizes and complies with all management plans and Biological Opinions affecting the Columbia River Basin in general and the Clearwater and Snake rivers in particular.

Hatchery Purpose

Construction of Dworshak National Fish Hatchery (NFH) was included in the authorization for Dworshak Dam and Reservoir to mitigate for the loss of the wild run of the North Fork Clearwater River "B-Run" summer steelhead (*Oncorhynchus mykiss*) caused by the construction and operation of the Dam and Reservoir. Dworshak Dam, constructed by the U.S. Army Corps of Engineers (COE), was authorized under the "Rivers and Harbor Act of 1962 - Flood Control Act of 1962" (Public Law 87-847, October 23, 1962). The construction of Dworshak Dam completely blocked access to all but the lower 1½ miles of the North Fork Clearwater River below the Dam. The intent of the steelhead mitigation program at Dworshak NFH is to return 20,000 adult steelhead to the mouth of the Clearwater River annually while perpetuating and maintaining the unique genetics of the North Fork B-Run summer steelhead population (Miller 1987; U.S. Fish and Wildlife Service 2002a).

In June 1982, under the Lower Snake River Compensation Plan (LSRCP), Dworshak NFH was expanded from its primary function as a steelhead mitigation facility to include spring Chinook salmon (*Oncorhynchus tshawytscha*). The COE was authorized by Congress in 1976 to implement the LSRCP in accordance with the Water Resources Development Act of 1976 (Public Law 94-587) to offset losses of anadromous fish in the Snake River basin caused by the four dam and navigation lock projects in the Lower Snake River. The spring Chinook salmon program at Dworshak was intended to replace lost sport and Tribal fisheries in the Clearwater River.

Hatchery Goals

The purposes for Dworshak NFH can be met by accomplishing four Goals, adapted from the federal authorizing legislation cited above, the Endangered Species Act (ESA) Biological Opinions, and U.S. v. Oregon.

Goal 1:Conserve and perpetuate the unique North Fork Clearwater River “B-Run” summer steelhead population.

Goal 2:Return 9,135 adult spring Chinook salmon to Lower Granite Dam annually.

Goal 3:Assure that all the requirements of legal orders and federally mandated legislation are met.

Goal 4:Provide accurate information and educational (I/E) opportunities for the public, media, schools, Tribal, State, and Federal agencies, and elected officials to enhance participation in understanding and stewardship of Dworshak NFH and United States Fish & Wildlife Service(USFWS) programs.

Hatchery Benefits

Public Use. Dworshak NFH has been open to the visiting public since its completion and dedication in August, 1969. The hatchery was designed primarily for steelhead production to mitigate for the loss of habitat by the construction of Dworshak Dam and Reservoir. Over the years a public tour route was developed to provide visitors an easy self-guided walking tour of the main buildings and grounds. Interpretive signs were designed and placed along this walking route in the 1980's and early 1990's. The signs explain the detailed operations of the state-of-the-art hatchery. Brochures and a welcome audio/visual program greet visitors in the main hatchery lobby, and a large viewing balcony overlooks the spawning room; displays and exhibits provide information on the hatchery life cycle of fish.

In 1990, an Open House and Kids’ Fishing Day at the hatchery was begun to coincide with National Fishing Week activities. Participation has increased steadily over the years, with as many as 800 – 900 children (12yr and under) catching trout from our kid’s fishing pond every year.

New in 2002, is a small non-profit sales area in the main hatchery building, called the Dworshak Spawn Shop, operated by the Friends of Northwest Hatcheries, Inc.(FNWH) out of Leavenworth, WA. The shop offers visitors unique gift items reflecting the natural resources of the region, with an emphasis on fish. Proceeds aid in funding outreach and educational projects at national fish hatcheries in the Northwest.

Fishery Benefits. It must be recognized that there are environmental conditions outside the hatchery that are beyond the control of hatchery managers, whenever an estimate of the benefits of an anadromous fish hatchery are made. This variability can affect post-release survival of juveniles and numbers of returning adults. During times of good ocean and river conditions resulting in healthy adult returns, significant economic activity is generated through harvest of Dworshak NFH summer steelhead and spring Chinook salmon.

Additionally, the role of a Federal mitigation hatchery is to compensate for natural habitat lost to Federal hydro-projects. Therefore, it can be surmised that the economic benefit of the mitigation

hatchery is interwoven into the economic benefit of the hydro-power projects being mitigated for,

and that the hatchery can be characterized as an operating expense of the hydro-power project, both of which provide significant benefits to the American public.

The benefits of anadromous fish in the Clearwater River relate to providing a harvestable product on a seasonal basis. Sport, Tribal, and commercial fisherman harvest significant numbers of returning hatchery adult summer steelhead and spring Chinook salmon annually.

CHAPTER 1 – INTRODUCTION AND BACKGROUND

1.1 Purpose of and Need for Plan

Dworshak NFH was constructed by the COE between 1966 and 1970. The purpose of Dworshak NFH was to mitigate for summer steelhead populations and habitat that were lost after the construction of Dworshak Dam, 1½ miles above the mouth of the North Fork Clearwater River. In 1982, Dworshak NFH was expanded as part of the LSRCP to include spring Chinook salmon. The purpose of the spring Chinook salmon program at Dworshak NFH was to mitigate for the loss of spring Chinook salmon sport and Tribal harvest in the Clearwater River caused by the construction and operation of four hydroelectric dams on the Lower Snake River.

In the past, hatchery programs were modified based on recognized needs and the capabilities of the facility. Today, hatchery programs are still dynamic with public appeal, legislative mandates, judicial decrees, and the ESA being the major impetus for change. Thoughtful planning processes based on sound policy and scientific information is essential.

The U.S. Fish & Wildlife Service (Service) recognizes the need for a comprehensive hatchery planning process to meet the present day and future fishery management challenges of conserving Pacific salmon and other anadromous and freshwater fish species. The development of these plans will help to: 1) integrate Service objectives and priorities with those of co-managers, other agencies, and resource programs; 2) fulfill our obligations under the ESA and relevant fisheries conservation, mitigation, and management programs; 3) identify and define in specifics what hatchery reforms we are implementing to achieve our objectives; and, 4) provide a foundation for future program and budget development and review. This plan recognizes and complies with all management plans and Biological Opinions (BiOp) affecting the Columbia River Basin in general and the Clearwater and Snake rivers in particular.

The Service is committed to developing and maintaining a sound scientific and management foundation for its programs. The Service has participated with State, Tribal and Federal partners in reviewing and assessing hatchery operations as they evolve to become part of the solution to fisheries restoration and recovery goals. The Service has involved our cooperators in defining and evaluating our respective roles, and the Service continues to reach out to the general public, individual constituent groups, and local governments to explain our programs and initiatives. The Service has put in place a system for program evaluation that uses principles of adaptive management to integrate new information and expectations. The Service looks into this process to stabilize and strengthen Service fish production programs in fisheries restoration and recovery efforts of the Nation.

1.2 Description of the Planning Process

The planning process began in February, 2001, with establishment of the Dworshak Comprehensive Hatchery Management Plan (CHMP) Team, the core group responsible for drafting and revising the CHMP as it moves towards its anticipated completion by the end of FY04. The Team is composed

of Service staff directly involved with the hatchery program. Additional coordination was provided

by members of the Regional CHMP Steering Committee. The Steering Committee was composed of Service representatives from the Pacific Region who provided oversight to the CHMP process, developed the general CHMP format, and developed the time line for completing the CHMP process. In addition, the Steering Committee reviewed drafts of the Dworshak CHMP to ensure consistency with the approved format, other CHMP's under development in Region 1, and with Regional and National goals of the Service Fishery Program.

1.3 Composition of Planning Team

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1.4 Review and Update of Plan

Because the biological, sociological, economic, and political environment is constantly changing, the roles and responsibilities of Dworshak NFH can also be expected to change. It was the intent

from the beginning that the CHMP would itself be dynamic to reflect that nature. Therefore, it was necessary to include a process for reviewing and updating the plan on a periodic basis. Review and

updating will take place at least once every five years and will be the responsibility of the Dworshak Hatchery Evaluation Team (HET).

1.5 Fisheries Program Mission, Goals, and Priorities

Our National Fish Hatcheries have authority for construction, operation, and maintenance that is contained in a variety of specific and general statutes. The remainder of the Fisheries Program is guided by a variety of general statutory mandates and authorities. Without the specific direction that would come from organic legislation, the Service has continually adjusted the priorities of the entire Fisheries Program, at the national level, to guide the Program and ensure that each Region within the Service is focusing their limited resources on the highest priorities of the Nation.

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The following paragraphs are excerpted from Conserving America's Fisheries - U.S. Fish and Wildlife Service Fisheries Program Vision for the Future (USFWS 2002) and outline the Fisheries Program's mission, goals and priorities. The entire document is available at http://pacific.fws.gov/Fisheries.

In order to better conserve and manage fish and other aquatic resources in the face of increasing threats, the Service worked with partners to refocus its Fisheries Program and develop a vision. **The vision of the Service and its Fisheries Program is working with partners to restore and maintain fish and other aquatic resources at self-sustaining levels and to support Federal mitigation programs for the benefit of the American public.** To achieve this vision, the Fisheries Program will work with its partners to:

- **Protect the health of aquatic habitats.**
- **Restore fish and other aquatic resources**
- **Provide opportunities to enjoy the benefits of healthy aquatic resources**

In July, 2001, the Sport Fishing and Boating Partnership Council (SFBPC) was charged by the Service to convene a steering committee representing perspectives from a broad array of stakeholders in fish and aquatic resource conservation to work with the Fisheries Program during the development of a new blueprint for the future. This provided partners with a unique opportunity to be engaged before the strategic vision was drafted. It was also unique because the Fisheries Steering Committee included representatives from the Service, along with partners and stakeholders.

In January, 2002, the SFBPC Fisheries Steering Committee provided the Service with a set of consensus recommendations on the Fisheries Program's role in the partnership effort to conserve the nation's fish and other aquatic resources. This report, entitled, "A Partnership Agenda for Fisheries Conservation," along with the earlier SFBPC hatchery report, "Saving a System in Peril," were keystone elements in developing the Fisheries Program's strategic vision. Using these two reports and working collaboratively with partners, the Service has better defined its role in

conserving and managing aquatic resources across the county. This strategic vision discusses where the Fisheries Program is today, where it needs to go in the future, and why it is important to

get there. To move forward and be successful in this role, the Fisheries Program must be solidly supported, backed by sound science, and grounded in dynamic partnerships.

The Service will also ensure that actions taken by the Fisheries Program will be consistent with strategic plans being developed by the Department of the Interior and the Service as a whole, and that Fisheries Program actions will help achieve performance targets laid out in those plans. The Fisheries Program's strategic planning effort is proceeding parallel to the strategic planning efforts being conducted by the Department and the Service. These planning efforts have been closely coordinated to ensure agreement and consistency among the three levels of management.

The Service is re-committing to its role as a partner in conserving America's fish and other aquatic resources. In some cases, the Fisheries Program will lead; in others it will facilitate or follow. In all cases, the Fisheries Program will focus its efforts and activities on what it is best positioned to contribute based on its unique resources and capabilities, recognizing that sound science and solid partnerships will continue to be the key to aquatic resource stewardship. Working with its partner, the Fisheries Program has identified seven areas of emphasis with associated goals, objectives, and actions to focus on in the future. In some cases, these actions reflect a reaffirmation of current activities; in other cases, they reflect some change in those activities. In a few cases, the actions reflect a new activity for the Fisheries Program. Many of its current activities support these goals and objectives, and there will be some opportunities to refocus and change within existing resources. However, the scope and speed with which this blueprint for the future becomes reality will depend on the level of support and resources that are available to the Fisheries Program.

Listed below are the seven national level focus areas identified in Conserving America's Fisheries - U.S. Fish and Wildlife Service Fisheries Program Vision for the Future (USFWS 2002). Under each national focus area are sub-focus areas identified in the Pacific Region Fisheries Program Strategic Plan (USFWS 2003). This Regional Strategic Plan and the sub-focus areas listed were developed with the help of Tribal, State, internal and external partners, in addition to other stakeholders.

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National Focus Area: Partnerships and Accountability

Regional Sub-Focus Areas

- Maintain communication with stakeholders and establish meaningful partnerships for the purpose of accomplishing all of our goals.
- Improve accountability by establishing and implementing a better system for measuring and reporting progress.

National Focus Area: Aquatic Species conservation and Management

Regional Sub-Focus Areas

- Native species will be protected and enhanced while maximizing species diversity, recreational opportunities and meeting tribal needs.

- Minimize introductions of aquatic nuisance species while attempting to contain, reduce, and eliminate them.

- Support, facilitate or lead collaborative approaches managing interjurisdictional fisheries while conserving and restoring fish populations.

National Focus Area: Public Use

Regional Sub-Focus Areas

- Promote quality recreational fishing.
- Identify, meet, and obtain full funding for mitigation fisheries.

National Focus Area: Cooperation with Native Americans

Regional Sub-Focus Area

- Assist Native American tribes in their endeavors to manage, protect, and conserve their trust resources.

National Focus Area: Leadership in Science and Technology

Regional Sub-Focus Area

- Provide leadership in science and technology by using state-of-the-art and scientifically sound research studies and management techniques.

National Focus Area: Aquatic Habitat Conservation and Management

Regional Sub-Focus Area

- Protect, conserve and restore aquatic habitat by collaborating with internal and external partners with land management or regulatory authority.

National Focus Area: Workforce Management

Regional Sub-Focus Area

- Develop a diverse, effective, and motivated workforce.

1.6 National Fish Hatchery System - National/Regional Overview and Statutory Mandates/Authorities

The Service's stewardship of the Nation's varied and valuable fishery resources dates from the appointment of Spencer Baird as Commissioner of Fish and Fisheries by President Ulysses S. Grant in 1871. That initial Federal involvement was in response to concern over the widespread decline in domestic food fish supplies. In 1872, Congress provided the first appropriation for the Fishery Program when it funded the introduction of shad, salmon, whitefish, and other food fishes into waters to which they were best adapted. A little later that year, "The propriety was strongly urged, at the Boston meeting, of sending some experienced fish-culturist to the west coast for the purpose of securing a large amount of spawn of the California salmon." Mr. Livingston Stone traveled to California and established a hatching-works on the McCloud River. This was the first salmon breeding unit in the United States, the first hatchery to be established with federal funds, and the beginning of the National Fish Hatchery System.

During the early years of the hatchery program, most National Fish Hatcheries were established under general authorizations for fisheries development as specified in appropriation acts. Then in

the 1930's a series of acts provided authorizations for hatchery development. Under this authority, the National Fish Hatchery System expanded on a planned basis.

The Service has a 130-year history of leading Federal fishery conservation efforts in the Pacific Northwest. During this time, our Federal fishery resource involvement and responsibilities have grown, diversified, and undergone several modifications in response to continually changing needs. The program shifts and expansions evolved to address the circumstances of each era. Today, the Service is taking a holistic approach to fishery conservation. Present activities focus on a broad array of scientific fishery management and conservation efforts.

A historical background into the establishment and operation of National Fish Hatcheries in Region 1 is provided in **Attachment 1** (Note: Region 1 is the Pacific Region and includes Washington, Oregon, Idaho, California, Nevada, Hawaii and the Pacific Territories). Since the establishment of the first salmon hatchery on the McCloud River, 67 hatcheries or fish facilities have been established in California, Idaho, Oregon, and Washington. Only 19 of those hatcheries, 2 fish facilities, and 1 technology center are in operation today. The remainder have either been closed or transferred to State or other Federal agencies.

The development of a broad range of statutory mandates and authorities under which the Service conducts its hatchery program along with numerous other fishery related activities conducted in cooperation with other Federal, State, Tribal, and private entities is documented in **Attachment 2**. Vested with significant legal responsibilities under State and international agreements, treaties and laws, the Service conducts an extensive conservation effort in order to help protect and restore native aquatic species and their habitats with the goal of preempting severe declines and potential listings under the ESA.

The Region 1 Fisheries Program consists of four major program activities: National Fish Hatcheries, Fish Health Centers, the Abernathy Fish Technology Center, and Fishery Resource Offices/Fish and Wildlife Offices. Successful implementation of the Service's hatchery activities requires close coordination and cooperation with the other three Fisheries Program activities. The Abernathy Salmon Technology Center provides state-of-the-art applied research in several fields including development of new fish diets for salmonid and sturgeon culture, use of genetic identification in the recovery and restoration of native stocks, and development of new and improved techniques to increase the efficiency of fish culture and captive brood stock operations. Fish Health Centers participate in Investigational New Animal Drug (INAD) registration, provide diagnostic and veterinarian services on wild fish stocks and hatchery-reared fish, and supply health certifications for the export of fish and fish eggs. Fishery Resource Offices/Fish and Wildlife Offices participate in a wide variety of activities including coast-wide stock assessment and evaluation, coded-wire tagging of hatchery indicator stocks for the U.S./Canada Treaty, evaluation of hatchery production, and assessment of new approaches to produce "wild type" fish at culture facilities. These offices also participate in a broad range of other activities including habitat assessment and restoration, non-indigenous species coordination, natural production studies, harvest assessment, fish passage coordination, and endangered species listing and recovery activities.

1.7 Regional Fishery Goals and Priorities

The Pacific Region Fisheries Program is committed to focusing its priorities and resources toward the conservation, recovery, and restoration of native resident and interjurisdictional species. The Fisheries Program works with State, Federal, Tribal and other partners, as well as on Service, Tribal, and other Federal lands, to ensure that its actions purposefully contribute to these objectives. Regional priorities are as follows:

1.7.1 Implementing Hatchery Reform. National Fish Hatcheries are reforming hatchery practices to conform with their associated scientific foundations and management evaluations of those efforts. National Fish Hatcheries in the Pacific Region produce and release fish, and stocks of fish, as identified in approved Hatchery Genetic Management Plans (HGMP).

1.7.2 Implementing Comprehensive Hatchery Management Plans. Implementation of the CHMP is a highly significant Regional priority. Comprehensive plans incorporate the rationale, authorities and supportive documentation for operation and management of National Fish Hatchery programs.

1.7.3 Hatchery Evaluations. Monitoring and evaluation of hatchery production programs are a critical component of effective hatchery operations. Completion of hatchery management plans will further identify research needs and assure quality.

1.7.4 Hatchery Evaluation Teams. To foster and enhance communication in the hatchery production and evaluation process, active participation in HET's by Service programs, resource agencies, and public partners is a Fisheries Program priority.

1.7.5 Habitat Restoration and Technical Assistance to Other Regional Programs. Providing technical assistance to other Regional programs on Service lands with Partners for Fish and Wildlife and other Service habitat restoration efforts is a high priority of the Fisheries Program.

1.7.6 Tribal and Federal Lands. Providing support to Tribal Governments and Federal land management agencies for fish and wildlife resources on their lands has always been and continues to be a high priority.

1.7.7 Fish Passage Improvement. An important part of the Fisheries Program is habitat restoration which re-establishes access to important historic habitats for fish. As such, emphasis is placed on fish passage improvement. A high priority is given to identifying and correcting fish passage problems at National Fish Hatcheries, other Service and non-Service lands.

1.7.8 Endangered Species Act. The Fisheries Program promotes and initiates actions that ensure all Fisheries Stations in the Pacific Region are in compliance with the ESA.

1.7.9 Compliance With Court Agreements and Other Legal Obligations. The Fisheries Program complies with court agreements and other legal obligations, and enhancement efforts that

contribute to the mitigation, conservation, restoration, and recovery of listed, candidate and imperiled fish species, both anadromous native fish and resident native fish, such as, bull trout, cutthroat trout, desert fishes, and others.

1.7.10 Mitigation. The Fisheries Program implements artificial production to comply with mitigation responsibilities consistent with Congressional mandates and funding.

1.7.11 Restoration and Recovery of Native Fishes. Restoration and recovery of native fishes is a Regional priority. Healthy stocks of native fish are indicators of clean water and healthy aquatic ecosystems. Healthy stocks of native fish also provide harvest opportunities for recreational, commercial, and tribal fishers.

1.7.12 Ecosystem and Cross-program Approach. The Fisheries Program continues to work within an ecosystem and cross-program approach using the collective expertise of our employees and Programs in coordinated fashion.

1.7.13 Make Full Use of Computer and Database Technology. It is an ongoing Regional priority to strengthen our staff capabilities and make full use of computer and database technology in order to increase program effectiveness and efficiency, and meet the needs of resource management agencies, tribes, and other Federal agencies.

1.7.14 Outreach. Educational and outreach opportunities are pursued to enhance public understanding of program responsibilities, capabilities, and accomplishments, and will continue to be an important component of the Fisheries Program.

1.8 Legal and Policy Guidance

National Fish Hatchery programs in the Columbia River Basin are shaped by various policies, regulations, laws, agreements and legislative mandates. NFH managers and policy makers are constantly challenged with the complex task of implementing a comprehensive state-of-the-art hatchery program while complying with legal, regulatory, and legislative mandates which have different and sometimes conflicting purposes. For example, the Mitchell Act and subsequent amendments, ESA and subsequent BiOp, Treaty of 1855 with Columbia River Tribes, U.S. v Oregon court order of 1969 and subsequent Columbia River Fish Management Plan all guide production in the Columbia River. Chapters 2, 3 and 4 further discuss legal justification and operational guidance for Dworshak National Fish Hatchery.

CHAPTER 2 – HATCHERY AND RESOURCE DESCRIPTION

2.1 Hatchery Overview

Dworshak National Fish Hatchery is located approximately 40 miles east of Lewiston near the community of Ahsahka in Clearwater County, Idaho (**Attachment 3**) and lies within Nez Perce Indian Reservation boundaries. The hatchery is situated at the confluence of the North Fork and the Mainstem Clearwater River at river kilometer 65 in the Snake River Basin, Idaho. The Hydrologic Unit Code (EPA Reach Code) is 1706030602600.10.

Currently, Dworshak NFH operates with a staff of 26; seven in administration, nine in maintenance, and 10 in production. A summer youth program is conducted every summer to provide opportunities for youth to become acquainted with fishery resource conservation programs. Volunteers are used to assist with outreach activities and station operations whenever possible.

2.2 Hatchery Purpose

Construction of Dworshak NFH was included in the authorization for Dworshak Dam and Reservoir to mitigate for the loss of the wild run of the North Fork Clearwater River, "B-Run," summer steelhead (*Oncorhynchus mykiss*) caused by the Dam and Reservoir. Dworshak Dam, constructed by the COE, was authorized under the, "Rivers and Harbor Act of 1962 - Flood Control Act of 1962", Public Law 87-847 (U.S. Congress, 1962). The construction of Dworshak Dam completely blocked access to all but the lower 1½ miles of the North Fork Clearwater River below the Dam. The intent of the steelhead mitigation program at Dworshak NFH is to return 20,000 adult steelhead to the mouth of the Clearwater River annually while perpetuating and maintaining the unique genetics of the North Fork B-Run summer steelhead population (Miller 1987; U.S. Fish and Wildlife Service 2002a).

In June, 1982, under the LSRCP, Dworshak NFH was expanded from its primary function as a steelhead mitigation facility to include spring Chinook salmon (*Oncorhynchus tshawytscha*). The COE was authorized by Congress in 1976 to implement the LSRCP in accordance with the Water Resources Development Act of 1976 (Public Law 94-587) to offset losses of anadromous fish in the Snake River basin caused by the four dam and navigation lock projects in the Lower Snake River. The spring Chinook salmon program at Dworshak was intended replace lost sport and Tribal fisheries in the Clearwater River.

2.3 Facility and Site Description

Dworshak NFH has 26 buildings altogether; four administrative type buildings, four residences, 11 buildings used in production and maintenance, and six storage buildings. There are currently no plans for any additional construction although improvements, maintenance and rehabilitation is performed on a regularly scheduled basis. Details of the various buildings, their primary uses, and improvements are listed in **Attachment 4**.

The hatchery's outdoor rearing units include four adult holding ponds, 84 Burrow's Ponds (BP's), 40 raceways, 128 nursery tanks, and 58 16-tray incubator stacks. Details of the physical dimensions and other characteristics of these rearing units are listed in **Attachment 5**. Details of

water use and management are provided in Chapter 3. The physical layout of the hatchery grounds is depicted in **Attachment 6** and an aerial photograph (**Attachment 7**) shows the hatchery in relation to Dworshak Dam and the confluence of the North Fork and mainstem Clearwater rivers.

2.4 Archeology/Cultural Resources

Within the hatchery compound, but owned separately, is a historic Nez Perce Tribal Presbyterian Church. The Church is maintained and used infrequently by the Tribe. The church is within public view from the main parking lot. To the north of State Highway 7 from the hatchery parking lot entry is a Tribal cemetery, located on the hillside above the roadway.

The Nez Perce have fished the Clearwater River seasonally for many years. Their history and culture revolve around the natural world and they have deep reverence for all living things in that world. Salmon and steelhead have played a significant role in the tribal culture, both historically and the present. The Nez Perce Tribe and the FWS have an agreement in place as part of the tribal trust responsibilities by providing fishing access from the west end of hatchery property. A permanent walkway was constructed through and around the hatchery perimeter along the North Fork for tribal fishing purposes. Fishing takes place in front of the hatchery fish ladder opening on the northwest end of the property. The tribe is responsible for all maintenance and law enforcement concerns of the fishing and access site.

In addition to the tribal history, the Lewis and Clark Corps of Discovery spent time in the Clearwater basin while making their way to the Pacific Ocean and back from 1804 to 1806. The group camped near the present day Dworshak hatchery site, across the Clearwater River at the Canoe Camp site, which is part of the National Park Service - Nez Perce National Historic Park.

In 1805, Captain Clark described in his journal a place where two rivers met, with a healthy stand of white pine trees that could be used for dug-out canoes in which to navigate the river west. He noted Nez Perce children fishing for salmon in the river, using spears and gaffs to catch the large fish. Lewis and Clark also were the first explorers to describe a new species of 'salmon' in the North Fork river, smaller, but a good fighting fish, and in great abundance at certain times of the year. The location from which Clark described this scene was the hillside where a present day tribal cemetery lies just above the hatchery grounds. The Indian children were fishing in the North Fork Clearwater River, and the new fish they described would later be called steelhead trout.

2.5 Watershed/Ecosystem Setting

The following descriptions and summaries were taken from the Clearwater River Subbasin Summary (Ecovista *et. al* 2002) and the Bull Trout Recovery Plan (U.S. Fish and Wildlife Service 2002b)

2.5.1 Location and General Description. The Clearwater River subbasin is located in north central Idaho between the 46th and 47th latitudes in the northwestern portion of the continental United States (**Attachment 8**). The subbasin is bracketed by the Salmon River subbasin to the south and St. Joe River subbasin to the north. The Clearwater River drains approximately a 9,645

square mile area that extends approximately 100 miles north to south and 120 miles east to west.

The Clearwater derives its flow from a network of tributaries, four of which are primary. The Selway and Lochsa Rivers both originate at the Idaho—Montana border in the Selway Bitterroot divide and flow in a westerly to northwesterly direction through precipitous breaklands and forested canyons to their junction at Lowell, ID. The confluence of the Lochsa and Selway form the Middle Fork of the Clearwater, which flows in a westerly direction before joining the South Fork Clearwater at the town of Kooskia, ID. From this point on, the river is known as the mainstem Clearwater. The Clearwater continues to flow in a westerly to northwesterly direction through sparsely vegetated and weathered canyonlands to the town of Ahsahka, at which point the North Fork of the Clearwater enters. Dworshak Dam, located two miles above the mouth of the North Fork Clearwater River, is the only major water regulating facility in the subbasin. Dworshak Dam was constructed in 1972 and eliminated access to one of the most productive systems for anadromous fish in the subbasin. From Ahsahka, the Clearwater River courses through semi-arid canyons and agricultural land and enters the Snake River located on the Washington—Idaho border at the town of Lewiston, Idaho, 139 river miles upstream of the Columbia River.

2.5.2 Topography. The topography of the Clearwater River Basin is quite variable. It is a region of mountains, plateaus, and deep canyons within the Northern Rocky Mountain geographic province. Elevations range from 216 meters (710 feet) at the confluence of the Clearwater and Snake rivers to over 2,743 meters (9,000 feet) in the Bitterroot Mountains. The many ridges and mountains of the Clearwater and Bitterroot ranges in the central and eastern part of the basin have convex slopes ranging from 20 to 25 percent. Steeper slopes exist in the glacial cut valleys in the upper elevaitons around the recover unite at the head of many tributary valleys.

The breaklands of the basin refer mainly to the larger river valleys such as those found in the mainstem Clearwater River canyon. The lower Clearwater River separates the Camas and Palouse prairies through the formation of these steep river breaks. The upland prairies may rise over 914 meters (3,000 feet) above the lower Clearwater River.

2.5.3 Geology. The main geologic parent material for soils and sediment is metamorphic, granitic, and basalt rock types. The Idaho granite batholith makes up much of the bedrock found in the Clearwater and Bitterroot Mountains in the central and eastern portions of the basin. Batholithic rock erodes to sand contributing to fine sediments in streams, and Belt Series rock often exhibits heavy stream bedload movement when associated with recent glaciation. Contact between the two rock formations produces an unstable layer that is often associated with frequent mass failures resulting in landslides.

2.5.4 Climate and Hydrology. The Clearwater River Basin has a wide range of climates. Warm, moist maritime air masses from the Pacific strongly influence the climate across the basin, except

for the higher eastern elevations and the southern most areas. These areas are more similar to the northern Rocky Mountain climate conditions with drier and cooler climates. Annual precipitation in the area is 762 to 2,540 millimeters (30 to 100 inches) with over 90 percent occurring during the fall, winter, and spring. A seasonal snowpack generally covers the area during October to June, depending on elevation. Periodic, high intensity electrical storms are common during the summer

months and may ignite wildfires. Mean annual temperatures throughout the basin range from 10 to 13^{O} C (50 to 55^{O} F) at lower elevations to –3 to 0^{O} C (25 to 32^{O} F) in the upper elevations. Temperatures are generally below freezing in higher elevations of the drainage during the winter and can be in excess of 32^{O} C (90^{O} F) in the lower elevation canyons during the summer.

The Clearwater River originates in the Bitterroot Mountains at elevations ranging from 2,562 to 2,745 meters (8,400 to 9,000 feet). The Clearwater River contributes about one-third of the Snake River flow and about 10 % of the Columbia River flow, annually. Mean annual discharge of the Clearwater River is about 434 cubic meters per second (15,300 cubic feet per second) near the mouth.

Records for monthly flows indicate that peak flows generally occur in the months of May and June. Low flows most often occur in August and September which corresponds with high instream temperatures and low precipitation in most of the basin. The timing, duration and volume of peak flows are driven by snowmelt and/or by seasonal rainstorms at elevations less than 1,220 meters (4,000 feet). Rain-on-snow events can occur from November through March and may result in hydrograph peaks through this period.

2.5.5 Vegetation. Vegetation in the basin is characterized by canyon grasslands with steep, complex topography dominated by perennial bunchgrass and shrub communities; and forested canyons and uplands dominated by cedar-hemlock-white pine forests. Over 70% of the basin is covered with forested communities with about 12% made up of shrubland and grassland communities. Cedar-hemlock-white pine communities are generally productive and support a variety of tree species (*e.g.*, western red cedar (*Thuja plicata*), white pine (*Pinus monticola*), grand fir (*Abies grandis*), western *larch (Larix occidentalis*), and Douglas fir (*Pseudotsuga menziesii*)). Lodgepole pine (*P. contorta*), subalpine fir (A. lasiocarpa), ponderosa pine (*P. ponderosa*), and Engelmann spruce (*Picea engelmannii*) are also present at middle and high elevations within the basin. The majority of the grasslands occur in the foothills and breaklands as canyon bunch grass communities.

2.5.6 Fish and Wildlife. There are currently more than 30 species of fish inhabiting the Clearwater River, including 19 native species, two of which have been reintroduced. Several anadromous salmonid hatcheries raise and release spring Chinook salmon, fall Chinook salmon, coho salmon, and summer steelhead. Three non-native species have been introduced into Dworshak Reservoir and may be found downstream of the dam in the lower Clearwater River (**Attachment 9**).

The Clearwater subbasin is inhabited by approximately 340 terrestrial wildlife species. Species present on the list can be year-round residents of the subbasin or transients who inhabit the subbasin for only small portions of their life cycle. Most of the species diversity in the subbasin results from the presence of over 200 bird species. In addition to birds, approximately 73 mammal, 13 amphibian, and 13 reptile species occur in the subbasin (Ecovista *et. al* 2002). Currently, 51 species are state or Federal listed or candidate species (**Attachment 10**).

2.5.7 Hydroelectric Dams and Fish Passage Barriers. A number of smaller dams have been removed from the Clearwater subbasin which had substantial impacts on fisheries resources. The Lewiston dam, constructed in 1927 on the lower Clearwater River near the present site of the Potlatch pulp mill (RM 4) and operated by Washington Water Power, virtually eliminated Chinook salmon runs and substantially reduced steelhead runs into the Clearwater subbasin (Nez Perce Tribe and Idaho Department of Fish and Game 1990). Modifications were made to the Lewiston Dam in the early 1960's to facilitate fish passage and the dam was subsequently removed in 1973 as part of the Lower Granite Lock and Dam Project.

A low-head hydroelectric diversion dam on the North Fork Moose Creek (Upper Selway) thought to be a partial barrier for anadromous species was removed in the mid 1960s (Nez Perce Tribe and Idaho Department of Fish and Game 1990). A dam constructed by Washington Water Power in 1910 on the lower South Fork Clearwater (RM 22) near the town of Harpster blocked anadromous salmon species from the South Fork Clearwater River. The dam formed a complete barrier to fish migration, and anadromous salmonids were excluded from the upper watershed from 1911 to 1935 and from 1949 until 1963, when the dam was removed (Paradis et al. 1999). A fish ladder was installed in the dam in 1935 and was destroyed in 1949 by high flows (Paradis et al. 1999). Murphy and Metsker (1962) reported that steelhead were able to pass over the dam from 1935-1949, but Siddall (1992) reported that the dam failed to pass significant numbers of fish during this period.

The Kooskia Flower Mill Dam located on the Clearwater River about one mile above the mouth of the South Fork Clearwater River was built prior to 1910 and was in place until some time in the 1930's (Gerhardt 1999). The dam is estimated to have been about 6 feet high, and although fish passage is not documented, it has been suggested that upstream migration of anadromous salmonids was probably not impaired by this structure (Gerhardt 1999).

At 219 m in height with a reservoir approximately 86 km long and a maximum depth of 194 m, Dworshak Dam is the largest straight axis concrete dam in the United States. Dworshak reservoir extends 54 miles into the North Fork Clearwater River Canyon and provides 3.453 million acre-feet of storage, making it the largest storage project within the Nez Perce Tribe ceded area and the state of Idaho (Idaho Department of Fish and Game and Nez Perce Tribe 1991; U.S. Army Corps of Engineers 1975). Located 1.5 miles above the mouth of the North Fork Clearwater River, the dam blocked fish passage for anadromous fish to spawning habitat that could accommodate 109,000 steelhead trout redds and 74,000 Chinook salmon redds (U.S. Fish and Wildlife Service, 1962). The dam also inundated 16,970 acres of terrestrial and riverine habitats at full pool (U.S. Army Corps of Engineers 1975).

The project was authorized primarily for flood control (Mehrhoff and Sather-Blair 1985), with other purposes including power generation, commercial navigation and recreation (U.S. Army Corps of

Engineers 1974). Planning for the dam and reservoir was initiated by the COE in the 1950's. Authority for construction was contained in Public Law 87-874, Section 201 of the Flood Control Act of 1962 in accordance with House Document 403, 87th Congress, 2nd Session (U.S. Army Corps of Engineers 1975). On September 27, 1971, the river diversion tunnel was sealed and Dworshak Reservoir was formed (Hanson and Martin 1989). Filling of the reservoir was started in 1972 and

power generation began in 1973 (U.S. Army Corps of Engineers 1974). The final Environmental Impact Statement (EIS) was completed in 1985 (Hanson and Martin 1989).

The reservoir behind the dam is 86 km long at full pool. Maximum and mean depths are 194 m and 56 m, respectively. Surface area at full pool is 6,644 ha with 5,400 ha of kokanee habitat (defined as the area over 15 m deep). Drawdowns for flood control may lower the surface elevation 47 m and reduce surface area by as much as 52%. The reservoir has a mean retention time of 10.2 months and a mean annual discharge of 162 m^3/s (Falter 1982). High releases from the reservoir occur during spring run-off, during late summer when water is released for anadromous fish flows, and during the fall when the reservoir is lowered for flood control.

2.5.8 Land Use and Ownership. The land ownership of Clearwater River Subbasin has evolved from exclusive Nez Perce Tribal (NPT) occupancy in the 1800's to present day complex land ownership patterns. Currently, the subbasin includes the 1,250 square mile Nez Perce Indian Reservation of which 133 square miles are tribal or trust lands administered by the Bureau of Indian Affairs. The present division of land ownership is described in **Attachment 11**. The major landowners are the federal government (61.2 percent) and the private sector (32.3 percent). The U.S. Forest Service (USFS) controls the majority of the federal lands in the subbasin.

Land use within the Clearwater River Subbasin ranges from predominantly forestry-related activities in the Lochsa, lower Selway and upper South Fork drainages to agriculture, pasture and grazing in the mainstem Clearwater, Middle Fork and lower South Fork drainages. The proportion of forestry, agriculture, grazing, mining and other land-use practices within the subbasin is difficult to ascertain as most data refers to political boundaries such as counties and national forests. For the most part, the Lochsa, Selway and-upper South Fork drainages outside protected areas can be classified as forestry and recreation with grazing activity most prominent in the South Fork drainage. In addition to agriculture, pasture land and/or grazing in the mainstem Clearwater drainage, forestry activities are common in the canyons and headwaters of the tributaries. **Attachment 12** lists land use designations for the subbasin.

Presently about 41 percent of the subbasin is undeveloped with wilderness and undeveloped areas accounting for 21 percent and 20 percent respectively. Excluding the blocked area in the North Fork Clearwater River, the undeveloped area is about 42 percent with wilderness increasing to 28 percent and undeveloped areas decreasing to 14 percent. The majority of these lands lie in the Lochsa and Selway drainages. The Wild and Scenic Rivers Act includes 22 miles of the Middle Fork Clearwater, 62 miles along the Lochsa and 91 miles along the Selway Rivers. The Middle Fork and Lochsa rivers are classified as recreational rivers while the Selway River is a combination of recreational and wild.

Population density is relatively low throughout the subbasin. The subbasin has more than 28 municipalities ranging from the Lewiston-Clarkston urbanized locale (over 50,000 people) to the county seats of Orofino and Grangeville (4,000 people) to smaller towns scattered throughout the lower drainages. Most of the residential development occurs along the mainstem, Middle Fork and lower South Fork drainages and their tributaries. The Camas Prairie to the south and the southern area of the Palouse to the north have scattered areas of residential development and a number of

small municipalities.

Historically, mining was centered about gold dredging in the upper South Fork, Orofino Creek and Potlatch Creek drainages. Extensive mining from the 1860's to the mid 1900's took place in Crooked River, Red River, American River and Newsome Creek within the South Fork drainage. In recent years, mining activity has consisted of numerous small recreational operations and a few large commercial projects. Mining activities including the recent cyanide heap-leach operation on the upper South Fork have increased during the last two years. Other mining operations are located in the Lolo Creek drainage for gold, Mission Creek drainage for limestone and along the major subbasin rivers for sand and gravel. Generally, mining in the subbasin has impacted fish production in varying degrees through sedimentation and instream and riparian degradation.

2.6 History of Hatchery Stocks

2.6.1 Legal Authority. Dworshak NFH was originally constructed to raise summer steelhead (*Oncorhynchus mykiss*). The construction of Dworshak Dam by the COE was authorized under the, "Rivers and Harbor Act of 1962 - Flood Control Act of 1962" (Public Law 87-847, October 23, 1962). The construction of Dworshak NFH was included in the authorization for Dworshak Dam and Reservoir to mitigate for losses of anadromous summer steelhead in the North Fork Clearwater River caused by the dam and reservoir. A Memorandum Of Understanding (MOU) between the COE and the U.S. Fish and Wildlife Service (Service), in 1969 authorized the Service to operate Dworshak NFH with funding from the COE.

Dworshak NFH began raising spring Chinook salmon in 1981. The LSRCP was authorized by the Water Resources Development Act of 1976, Public Law 94-587, to offset fish and wildlife losses caused by the four dam and navigation lock projects in the Lower Snake River. Dworshak NFH was included as part of that plan to mitigate for spring Chinook salmon losses in the Clearwater River. In addition to the initial authorizations listed above, hatchery operations are authorized, sanctioned, and influenced by the following treaties, judicial decisions and specific legislation:

Treaty with the Nez Perce, 06/11/1855;
U.S. v. Oregon (Sohappy v. Smith, "Belloni" decision:, Case 899), 07/08/1969;
Endangered Species Act of 1973, 87 STAT. 884, 12/28/1973;
Salmon and Steelhead Conservation and Enhancement Act, 94 STAT. 3299, 12/22/1980; and
Pacific Salmon Treaty Act of 1985 (U.S./Canada Pacific Salmon Treaty), Public law 99-5, 16 U.S.C. 363, 03/15/1985.

2.6.2 Summer Steelhead: Production and Management History. Dworshak NFH consists of a mechanical, electrical, water reuse and reconditioning system employing filtration, biological nitrification, pollution control and monitoring facilities, alarm system, water chillers, heaters, and numerous pumps. Initial construction at Dworshak NFH included 84 BP's, 64 nursery tanks, and 9 adult holding ponds. Twenty-five BP's (System I) were operated on a heated recycle water flow, for rearing steelhead smolts to the initial target size of 180 mm in only one year. In 1973, System II (25 ponds) and System III (34 ponds) were converted from single-pass, 2-year rearing cycle, to

water reuse and heating for accelerated production growth. This second phase of construction, with added mechanical systems (biological filters, electric grid, sand filters, U.V. lamps, chillers, and boilers), increased production capacity and allowed all three water systems to be environmentally controlled. In the late 1980's, the target size for steelhead smolts was changed to 200 mm, based on data developed by the Service.

During the mid-1970's, with Dworshak NFH not meeting either production or mitigation goals, major operational changes were made. Review and studies of the reuse systems, water temperature regime, water quality, and fish culture techniques were done by hatchery staff and university scientists. Corrective measures followed which removed the computerized pneumatic feed system, eliminated the ultraviolet treatment of water reuse, redesigned the water flows to maximize single-pass use and a return to a more hands-on basic fish culture. Selecting cooler water temperatures from Dworshak Reservoir during the summer, adding minerals (sodium chloride and potassium chloride) to a soft water supply, removing supersaturated nitrogen gas, along with other designed mechanical changes and more involvement of hatchery staff in monitoring fish culture, all contributed positively towards improving the hatchery's program.

Further construction in the early 1980's added 18,000 square feet of nursery building, doubling the number of inside rearing tanks to 128. A new concept of biological filtration, known as a fluidized sand filter, replaced the oyster shell media in System I. This filtration system proved to be unworkable, making the option of using reuse in System I no longer available. However, in 2003 the COE started a rehabilitation of System I to bring reuse back into operation. The rehabilitation was completed and the system was put into operation in 2004. Also in the 1980's, an additional thirty 8'×80' raceways were constructed under the LSRCP to provide production facilities for spring Chinook salmon. Additionally in the 1980's, 5 of the 9 adult holding ponds were converted to raceways for needed rainbow trout mitigation for Dworshak Reservoir. That program was later modified, the raceways used intermittently for spring Chinook salmon rearing until 1997 when the Nez Perce Tribe began using them for rearing coho salmon.

The uniqueness of Dworshak NFH's water systems provides several options for egg incubation and rearing. Several temperature options are available for egg development through the incubators. The outside steelhead ponds are furnished single-pass river water from May into November when desired temperatures can be obtained through selector gates at Dworshak Dam. A pump station on the North Fork Clearwater River, one mile down river from the Dam, is capable of providing 92,500 gpm of water. In all three steelhead rearing systems, water reuse and heating is used during the colder months of November through March, enabling the hatchery to obtain sufficient fish growth. During reuse, 10-percent new water enters the system to make up for loss. Temperatures in each of the three outside steelhead rearing systems can be controlled independently when reuse and heated water are available.

Beginning in 1992, the hatchery was supplied with an additional 6400 gpm of gravity flow Dworshak Reservoir water directly by pipeline. This "clean" water, furnishing egg incubators and nursery rearing, has afforded disease protection from *Infectious Hematopoietic Necrosis* (IHNV) virus in the early production stages. During 1998, a water line was completed between Mechanical Building I and the main water line from the large boilers in Mechanical Building II. This line now enables the hatchery to heat all the nursery reservoir water for better steelhead production.

A Dworshak National Fish Hatchery Rehab Plan was prepared in 1990–91 by the COE. This rehab plan detailed major upgrades and needs of the then 20-year old hatchery. The hatchery continues to work with the COE on line items identified in the rehab plan. We are trying to accomplish some of the rehab project items through O&M funding. Larger items will need to be funded directly by the COE.

Since its construction the hatchery has served primarily as a mitigation hatchery for steelhead trout (*Oncorhynchus mykiss)*, a unique run of the North Fork Clearwater River "B" strain summer steelhead. The construction of Dworshak Dam and Reservoir completely blocked access to all but the lower 1 ½ miles of the river below the dam. Since that time, the FWS has endeavored to meet the mitigation goal of providing 20,000 adult Summer Steelhead Trout (SST) to the Clearwater River and to conserving the unique genetics of the stock.

The North Fork Clearwater River steelhead stock maintained by Dworshak NFH is unique. At maturity, males and females of this particular stock of "B" run steelhead average about 91 cm (36 inches) and 82 cm (33 inches) in length, respectively. Spawning stock is comprised of three age classes; I-, II-, and III-"salt" fish, referring to the number of complete years fish have spent in salt water.

Most "B" run steelhead enter the Columbia River in August through September, usually later than the smaller "A" run fish. The Clearwater "B" run steelhead may reach the Snake and Clearwater rivers in the fall, then over winter until their final run into the hatchery. Some of the fish actually arrive at Dworshak NFH in the fall. The Dworshak NFH trap is operated during the fall to ensure inclusion of sufficient early arriving steelhead (~500 adults) into the hatchery gene pool. The trap is then reopened from February through April to capture broodstock from the middle and late portions of the run.

Releases of steelhead smolts from Dworshak NFH began in 1970 with the first hatchery produced adults returning in 1972. **Attachment 13** summarizes the Dworshak NFH steelhead survival from smolt release to adult return to the hatchery from 1980 to present. Because of good smolt survival during emigration to the ocean and adult survival in the ocean, the program at Dworshak NFH has consistently provided adult returns sufficient to support both sport and Tribal harvest. **Attachment 14** summarizes the adult returns to the Clearwater River since the program was initiated, including hatchery returns and contributions to both the sport and Tribal harvests.

2.6.3 Spring Chinook Salmon: Production and Management History. The Dworshak NFH Spring Chinook Salmon (SCS) program was initially started using Chinook salmon stock from the Leavenworth and Little White Salmon NFH programs. Eggs were transferred from these facilities and made up the smolt releases from 1983 to 1986. Since these stocks were very strongly influenced by transfers to their programs from Carson NFH, the early Dworshak Chinook stock was considered a Lower Columbia River Carson derivative. The Chinook programs for brood years 1985 and 1986 consisted entirely of eggs that had been transferred from Rapid River State Fish Hatchery (SFH), which used Chinook trapped at Hells Canyon Dam to start that stock. Thus, smolts released from Dworshak NFH in 1987 and 1988 were entirely Rapid River stock, shifting the program away from using the Lower Columbia River Carson Chinook type stock. In the 14

years since 1988, Dworshak NFH has maintained its program from returns to its own rack, with the exception of two years when the program was below full production. In 1995, the Dworshak release was one third Kooskia stock Chinook and in 2001 about one third of the release was Rapid River stock (LookingGlass returnees collected at Lower Granite Dam). The recent returns to Dworshak NFH (1989 and later) are referred to as Dworshak stock, since they are progeny of returns to Dworshak NFH, rather than direct products of transfers of Rapid River stock. **Attachment 15** presents the genetic background and origin of stocks used to develop the Chinook stock at Dworshak NFH over the years.

Except for the past several years, the SCS program at Dworshak NFH has not been very successful in meeting the established mitigation goal of 9,135 adults returning to the Snake River above Lower Granite Dam. From 1987 to 1996, adult returns were sufficient only to meet broodstock needs at the hatchery with only minimal sport and Tribal harvest in some years. **Attachment 16** lists survival from smolt to adult return from 1988 through 2000. The primary reason for poor survival of SCS back to the hatchery is attributed to low smolt survival during emigration to the ocean. In 1997 the highest adult return to the Clearwater River on record was observed with even higher returns in 2000, 2001, and 2002. Returns in the last three years have exceeded the mitigation goal for the program and contributed significant numbers to both sport and Tribal harvests. **Attachment 17** provides a summary of returns to the hatchery and estimated harvest by sport and Tribal fisheries from 1987 to 2002.

2.7 Biological Risks and Ecological Interactions Between Hatchery and ESA Listed Salmonid Stocks

In the Clearwater River, there are three listed species and one species of concern. Summer steelhead, fall Chinook salmon, and bull trout are all listed under the ESA and the cutthroat trout is a species of concern. The primary species produced by Dworshak NFH are summer steelhead and spring Chinook salmon.

2.7.1 Summer Steelhead. Hatchery steelhead may affect listed Snake River steelhead in the mainstem and South Forks of the Clearwater River and in the lower portion of the Snake River. The program may also affect listed Snake River fall Chinook salmon in the lower portion of the Clearwater River. The steelhead program has the potential to affect listed steelhead and Snake River fall Chinook salmon in several ways: 1) predation; 2) competition; 3) adverse behavioral interactions; 4) disease transmission; 5) alteration of the gene pool; (6) harvest and/or (7) facility operation and maintenance.

2.7.1.1 Predation - The level of predation by hatchery released steelhead smolts on wild/natural salmonids is unknown. However, several factors suggest that predation by hatchery steelhead smolts on wild/natural salmonid fry and smolts is probably non-existent or not significant.

First, the emigration time of Passive Integrated Transponder (PIT) tagged Dworshak hatchery smolts in 1991 and 1992 to the Idaho Department of Fish & Game (IDFG) smolt trap at the head of Lower Granite Reservoir averaged about 1.5 days (37 km/day) (Idaho FRO datafiles). Based on the rapid emigration time through the lower Clearwater River, predation on listed salmonids by hatchery smolts should be minimal in the free-flowing

river sections.

Second, according to the literature, steelhead smolts released by the complex are generally below the size that actively preys on fish. Though small steelhead may feed on fish (Horner 1978; Hillman and Mullan 1989), 250mm TL appears to be the lower threshold size that has the greatest propensity to be piscivorous (Beauchamp 1990; IDFG 1992). The mean size at release for steelhead smolts at Dworshak NFH is 200 mm.

2.7.1.2 Competition - Studies to date indicate that yearling steelhead do feed as they emigrate through the Columbia River system (Giorgi 1991) although the relation between steelhead that reside for extended periods of time and those that actively migrate have not been conducted.

Dworshak NFH steelhead are released as smolts (200 mm target size at release). Competition between hatchery released smolts and wild salmonids is minimized due to the rapid emigration time in free flowing river sections (see section on predation above). Steelhead that are not ready to smolt and residualize in Lower Clearwater River tributaries present potential for conflict. These fish could directly compete with wild/natural salmonids for food, rearing space, and/or preferred habitats. Bigelow (1997) found that smaller fish (<180 mm FL) were much more likely to residualize than medium (180-200 mm) or larger fish (>200 mm). While we don't know if competition from residuals is a threat, we do know that these smaller fish do not emigrate at the same rate as the medium and large size groups. Bigelow also saw a decrease in the number of hatchery fish found in streams as the summer progressed. We are actively evaluating various fish culture practices to reduce the tendency toward residulisim for hatchery steelhead smolts.

2.7.1.3 Behavior - There are limited data describing adverse behavioral effects of hatchery steelhead releases on wild/natural salmonid populations. Hillman and Mullan (1989) reported that larger, hatchery-released fingerling Chinook salmon apparently "pulled" smaller wild/natural Chinook salmon with them as they drifted downstream, resulting in predation on the smaller fish by other salmonids. As mentioned above, several steps have been taken to produce functional smolts and minimize the time spent emigrating in the river. Time and method of release, size at release, and feeding and handling regimes of steelhead smolts before release, have all been modified over the last several years to prepare juvenile steelhead for smoltification. Reducing the time a smolt spends in the river and mainstem migration corridor will also reduce the potential for adverse interactions with listed salmonids.

2.7.1.4 Disease - Steelhead reared by the Complex have had outbreaks of IHNV in past years causing significant mortality. IHNV has come under better control over the past 10 years because of improved fish culture and modifications to the nursery water supply. Additionally, all Integrated Hatchery Operations Team (IHOT) guidelines concerning the release of fish undergoing a disease epizootic are strictly practiced. The potential still exists for horizontal transmission of IHNV and other diseases from hatchery steelhead to

wild/natural fish. However, Stewart and Bjornn (1990) stated that there was little evidence to suggest that horizontal transmission of disease from hatchery to wild/natural fish is widespread, although little research has been done in this area. The authors concluded that the full impact of disease on wild/natural fish from hatchery fish is probably underestimated. It is common knowledge that pathogens and diseases occur in wild/natural fish populations and that stresses can cause them to exhibit themselves. As mentioned, hatchery fish could potentially induce stresses on wild/natural populations through predation, competition, or adverse interactions.

2.7.1.5.Genetics - Beginning in 1973, and consistently since 1981, juvenile B-run summer steelhead have been outplanted in various locations in the South Fork Clearwater and Middle Fork Clearwater rivers. The intention of outplanting these fish is to spread returning fish out over a larger area for the sport fishery. Steelhead outplanted into Clear Creek on the Middle Fork Clearwater River are released at the Kooskia NFH adult fish trap approximately half a mile from the mouth of the creek and are allowed to move out of the creek on their own. Steelhead that return to Kooskia NFH are captured in the adult trap. Natural steelhead trapped at Kooskia NFH are released above the weir to continue their migration. Currently, hatchery steelhead that enter the Kooskia trap are either taken to Dworshak NFH for spawning or released in the South Fork for utilization in the sport fishery.

Steelhead that are not harvested could potentially spawn in one of the many tributaries to the South or Middle Fork Clearwater rivers. Spawning of hatchery fish with natural fish could potentially dilute the gene pool of natural steelhead. In FY2001, the Service collected genetic samples for comparison of natural and hatchery steelhead populations. Adult steelhead that are above broodstock needs at Dworshak are often taken to the South Fork Clearwater River for release to allow fishermen an additional opportunity to harvest these fish. These steelhead could also potentially spawn in tributaries to the South Fork Clearwater River.

2.7.1.6 Harvest - IDFG administers the sport harvest within the State, and the Nez Perce Tribe administers the Tribal fishery for steelhead returning to the Dworshak Fishery Complex. Because only those hatchery steelhead that are externally marked with an adipose fin clip can be sport harvested and it is a requirement for fishermen to release all unmarked fish unharmed, we believe there is minimal negative impacts to listed steelhead.

2.7.1.7 Facility operation and maintenance - Operation and maintenance includes operation of the adult collection facilities for trapping returning adult steelhead, water intake and discharge, in hatchery incubation and rearing phases, and general maintenance and construction. The operation of the adult collection facilities at both hatcheries has the potential for capturing adult wild steelhead. Since 1989, 1.7% to 0.4% of the adult steelhead captured at Dworshak NFH have adipose fins, although very few would be considered truly natural by fishery biologists. Based on other distinguishing characteristics, such as deformed fins, only a handful (<10) natural steelhead have been documented in the last 10 years; three of these fish were trapped in the fall of 1999. Any suspected natural adult steelhead captured in the ladder is immediately released back into the river upstream of the trap. Adult fall Chinook salmon are also occasionally trapped and these too are immediately released back into the river upstream of the trap.

About 200 cfs of water is pumped from the North Fork Clearwater River for use by Dworshak NFH. Water intakes at Dworshak are screened to prevent fish from being drawn into pumps. Water intake does not adversely affect the water level in the contributing stream. Discharge from the hatchery is permitted by the State of Idaho, Non-Point Discharge Effluent Standards (NPDES) and fully meets the requirements of the permit. Hatchery incubation and rearing phases have no additional impacts on listed steelhead or fall Chinook salmon.

All other maintenance or construction activities that could have an impact on water quality or quantity or could possibly impact steelhead or fall Chinook salmon will be consulted on as they arise. All required state and Federal permits would be obtained prior to any work being initiated. None are planned during FY2001.

2.7.2 Spring Chinook Salmon. The spring Chinook salmon program may affect listed salmonids. The release of spring Chinook salmon smolts occurs in spring, usually the last of March or the first week in April. Hatchery releases occur at about the same time as wild/natural steelhead are migrating as well. While they are migrating together, there may be some interaction, but we have no data on the exact nature or extent of the interaction. As far as effects of our spring Chinook salmon releases on fall Chinook salmon, we do not expect any interaction, since fall Chinook juveniles occupy a completely different habitat type than spring Chinook salmon during this time period.

The Dworshak Fisheries Complex spring Chinook salmon program has the potential to affect listed salmonids in several ways: 1) competition; 2) adverse behavioral interactions; 3) disease transmission; 4) facility operation and maintenance.

2.7.2.1 Competition - Studies to date indicate that yearling spring Chinook do feed as they emigrate through the Columbia River system (Giorgi 1991). This could have some effect on wild/natural steelhead. Hatchery spring Chinook are released as smolts (155 mm target size at release). Competition between hatchery released smolts and wild salmonids is minimized due to the rapid emigration time in free flowing river sections. These fish could directly compete with natural steelhead for food. While we don't know if competition from residuals is a threat, we do suspect that the incidence is extremely low.

2.7.2.2 Behavior - There are limited data describing adverse behavioral effects of hatchery spring Chinook releases on wild/natural salmonid populations. Hillman and Mullan (1989) reported that larger, hatchery-released fingerling Chinook salmon apparently "pulled" smaller wild/natural Chinook salmon with them as they drifted downstream, resulting in predation on the smaller fish by other salmonids.

2.7.2.3 Disease - Hatchery spring Chinook salmon at Dworshak NFH have had Bacterial Kidney Disease (BKD) problems in past years. BKD has been under better control the last

several years. Additionally, we strictly adhere to all IHOT guidelines concerning the release of fish undergoing a disease epizootic. The potential still exists for horizontal transmission of BKD and other diseases from hatchery spring Chinook salmon to wild fish. However, Stewart and Bjornn (1990) stated that there was little evidence to suggest that horizontal transmission of disease from hatchery to wild fish is widespread, although little research has been done in this area. The authors concluded that the full impact of disease on wild fish from hatchery fish is probably underestimated. It is common knowledge that pathogens and diseases occur in natural fish populations and that stresses can cause them to exhibit themselves. As mentioned, hatchery fish could potentially induce stresses on natural populations through predation, competition, or adverse interactions.

2.7.2.4 Harvest - IDFG administers the sport harvest within the State, and the Nez Perce Tribe (NPT) administers the Tribal fishery. Because only those hatchery SCS that are externally marked with a adipose fin clip can be harvested and it is a requirement for sport fishermen to release all unmarked fish unharmed, we believe there is minimal negative impacts to wild/threatened steelhead.

2.7.2.5 Facility operation and maintenance - Operation and maintenance includes operation of the adult collection facilities for trapping returning adult spring Chinook salmon, water intake and discharge, in hatchery incubation and rearing phases, and general maintenance and construction.

The operation of the adult collection facilities for returning adult hatchery spring Chinook salmon has the potential for capturing adult wild steelhead. Any suspected natural adult steelhead captured during broodstock collection are immediately released back into the river, upstream of the trap.

Water intake is screened to prevent fish from being drawn into pumps. Also water intake does not adversely effect the water levels in the contributing stream. Discharge is permitted by the State of Idaho, Non-Point Discharge Effluent Standards (NPDES) and fully meets the

requirements of the permit. In-hatchery incubation and rearing phases have no additional impacts on listed salmonids. All other maintenance or construction activities that could have an impact on water quality or quantity or could possibly impact listed salmonids will be consulted on as they arise. All required state and Federal permits would be obtained prior to any work being initiated. None are planned during FY2001.

2.8 Beneficial Uses

2.8.1 Historic. Fishing in the Clearwater River has been a primary activity of indigenous peoples for thousands of years. The Nez Perce people have fished seasonally from these waters for centuries. Their history and culture revolve around the natural world, and they have deep reverence for all living things. Salmon and steelhead have played a significant role in tribal culture, both pre-historic and in the modern era.

The description of steelhead trout by the Lewis and Clark expedition was the first recorded documentation of this species in the Clearwater basin. Commercial and sport fishing began in the late 19th century as the area was settled and developed. Mining, and later logging, were primary economic activities in these early communities, along with agriculture and ranching practices on early homesteads.

The communities of Orofino and Ahsahka have been economically supported by the natural resource industry since the1860's - logging, mining, fish & wildlife recreation, farming, ranching, non-consumptive recreation and hydro-electric power generation (Dworshak Dam).

2.8.2 Present Day. The NPT continues intermittent use of a private in-holding on Dworshak hatchery property for cultural purposes (church and cemetery), as well as accessing fishing areas.

Dworshak NFH has been open to the visiting public since its completion and dedication in August, 1969. The hatchery was designed primarily for steelhead production to mitigate for the loss of habitat by the construction and operation of Dworshak Dam and reservoir. Over the years a public tour route was developed to provide visitors an easy self-guided walking tour of the main buildings and grounds. Interpretive signs were designed and placed along this walking route in the 1980's and early 1990's. The signs explain the detailed operations of the state-of-the-art hatchery. Brochures and a welcome audio/visual program greet visitors in the main hatchery lobby, and a large viewing balcony overlooks the spawning room; displays and exhibits provide information on the hatchery life cycle of fish.

In 1990, an Open House and Kids' Fishing Day at the hatchery was begun to coincide with National Fishing Week activities. Participation has increased steadily over the years, with as many as 800 – 900 children (12 yr and under) catching trout out of our kid's fishing pond every year.

New in 2002, is a small non-profit sales area in the main hatchery building, called the Dworshak Spawn Shop, operated by the FNWH out of Leavenworth, WA. The shop offers visitors unique gift items reflecting the natural resources of the region, with an emphasis on fish. Proceeds aid in funding outreach and educational projects at national fish hatcheries in the Northwest.

The hatchery lies within the Northwest Passage Scenic Byway corridor, with Highway 12 paralleling the compound on the South side of the Clearwater River. The Clearwater River canyon is a major travel corridor from East to West, connecting Montana to Idaho, and summer seasonal traffic is greatly increased. The river is an attraction to many seasonal visitors for recreational opportunities including fishing, hunting, rafting, berry picking, swimming and sightseeing.

Plans are currently underway for updated interpretive information and a new kiosk highlighting the Lewis/Clark era, tribal influences on fishery resources, and what the future holds for hatchery management. Picnic tables and a remodeled visitor's lobby are also being planned to accommodate the 20,000+ annual visitors.

With the addition of a permanent outreach specialist and assistant, more public programs are being

offered on and off hatchery grounds. School groups make up one of the largest groups of visitors in the spring and fall when spawning is scheduled. Summer visitors are increasing yearly. Guided group tours are also increasing, as well as requests for more specialized educational programs revolving around specific fishery resource issues, or broader aquatic ecosystem themes.

2.8.3 Fishery Benefits. It must be recognized that there are environmental conditions outside the hatchery that are beyond the control of hatchery managers, whenever an estimate of the benefits of an anadromous fish hatchery are made. This variability can affect post-release survival of juveniles and numbers of returning adults. During times of good ocean and river conditions resulting in healthy adult returns, significant economic activity is generated through harvest of Dworshak NFH SST and SCS.

Additionally, the role of a Federal mitigation hatchery is to compensate for natural habitat lost to Federal hydro-projects. Therefore, it can be surmised that the economic benefit of the mitigation hatchery is interwoven into the economic benefit of the hydro-power projects being mitigated for, and that the hatchery can be characterized as an operating expense of the hydro-power project, both of which provide significant benefits to the American public.

The benefits of anadromous fish in the Clearwater River relate to providing a harvestable product on a seasonal basis. Sport, Tribal and commercial fisherman annually take a significant number of the returning hatchery adult population.

Steelhead and salmon play an important role in the overall aquatic ecosystem, and mean many different things to many different people. They can indicate the health of a watershed, and are a vital link on the natural food chain; they are caught for pleasure or sport; they are used for food and cultural ceremonies. The majority of people, no matter their background, like the idea of fish being in the river.

CHAPTER 3 - HATCHERY AND RESOURCE MANAGEMENT

3.1 Hatchery Goals, Objectives, and Tasks

This plan follows the basic guidelines presented in Tactical Planning in Fish and Wildlife Management and Research (Phenicie and Lyons 1973). The purposes for Dworshak NFH can be met by accomplishing four Goals, adapted from the federal authorizing legislation cited in Chapter 2, the Endangered Species Act (ESA) Biological Opinions, and U.S. v. Oregon. Each Goal has a number of Objectives designed to accomplish different, but related, aspects of the Goal.

Goal 1: Conserve and perpetuate the unique North Fork Clearwater River "B-Run" summer steelhead population.

Objective 1.1: Return 30,000 adult summer steelhead to the Columbia River and 20,000 adult summer steelhead to the Clearwater River annually.

Task 1.1.1: Annually collect 3000 adults to provide between 1,200 and 1,500 fish for broodstock.

Task 1.1.2: Rear and release 2.3 million smolts into the Clearwater River annually.

Objective 1.2: Maintain the genetic integrity and diversity of the North Fork Clearwater River "B-Run" summer steelhead population through proper broodstock collection, spawning procedures, and fish culture techniques.

Task 1.2.1: Ensure that broodstock includes at least 500 adults collected from the early return (fall) component of the run.

Task 1.2.2: Collect broodstock to represent the full spectrum of the run.

Task 1.2.3: Spawn and rear the early return component of the run separately from the remaining run.

Task 1.2.4: Maintain as close to a 1:1 male to female spawning ratio as possible.

Task 1.2.5: Spawn adults to represent the entire range of timing of reproductive maturity.

Task 1.2.6: Spawn adults so that all age classes are represented.

Task 1.2.7: Work with the regional genetics lab to insure that the genetic diversity of the Dworshak summer steelhead population is maintained.

Objective 1.3: Produce the healthiest, highest quality fish possible at every stage of production.

Task 1.3.1: Monitor health and disease status of fish, following the Service Fish Health Policy and Integrated Hatchery Operation Team (IHOT) Guidelines.

Task 1.3.2: Maximize survival at all life stages using disease control and prevention techniques. Prevent introduction, spread or amplification of fish pathogens.

Task 1.3.3: Conduct hatchery evaluation studies to investigate alternative strategies to improve water management, broodstock management, incubation, rearing, and release strategies. Support research on physiology, diet, fish health, and genetics and other Columbia and Snake River Basin projects.

Objective 1.4: Conduct monitoring and evaluation activities that will provide information on the progress of the hatchery in meeting its return objectives for summer steelhead.

Task 1.4.1: Conduct regularly scheduled HET meetings.

Task 1.4.2: Biosample returning adults.

Task 1.4.3: Use coded-wire tags(CWT) to mark and track representative production groups in the ocean and Columbia River basin.

Task 1.4.4: Cooperate with the State and Tribe to obtain estimates of sport and Tribal harvest in the North Fork and Lower Clearwater River.

Objective 1.5: Cooperate and Coordinate with the IDFG and the NPT to develop opportunities for sport and tribal harvest.

Task 1.5.1: Collect and spawn broodstock for IDFG projects in the LSRCP program.

Task 1.5.2: Conduct semi-annual coordination meetings.

Task 1.5.3: Monitor health and disease status of fish, following the Service Fish Health Policy and IHOT Guidelines.

Goal 2: Return 9,135 adult spring chinook salmon to Lower Granite Dam annually.

Objective 2.1: Release 1.05 million spring Chinook salmon smolts from the hatchery each year.

Task 2.1.1: Collect between 650 and 800 adults annually for broodstock.

Task 2.1.2: Collect broodstock to represent the full spectrum of the run.

Task 2.1.3: Maintain as close to a 1:1 male to female spawning ratio as possible.

Task 2.1.4: Spawn adults to represent the entire range of timing of reproductive maturity.

Task 2.1.5: Spawn adults so that all age classes are proportionally represented.

Objective 2.2: Produce the healthiest, highest quality fish possible at every stage of production.

Task 2.2.1: Monitor health and disease status of fish, following the Service Fish Health Policy and IHOT Guidelines.

Task 2.2.2: Maximize survival at all life stages using disease control and prevention techniques. Prevent introduction, spread or amplification of fish pathogens.

Task 2.2.3: Conduct hatchery evaluation studies to investigate alternative strategies to improve water management, broodstock management, incubation, rearing, and release strategies. Support research on physiology, diet, fish health, and genetics and other Columbia and Snake River Basin projects.

Objective 2.3 Conduct monitoring and evaluation activities that will provide information on the progress of the hatchery in meeting its return goal for spring chinook salmon.

Task 2.3.1: Conduct regularly scheduled HET meetings.

Task 2.3.2: Bio-sample returning adults.

Task 2.3.3: Use CWT's to mark and track representative production groups in the ocean and Columbia River basin.

Task 2.3.4: Cooperate with the State and Tribe to obtain estimates of sport and Tribal harvest in the North Fork and Lower Clearwater River.

Objective 2.4: Cooperate and Coordinate with the IDFG and the NPT to develop opportunities for sport and tribal harvest.

Task 2.4.1: Conduct semi-annual coordination meetings

Task 2.4.2: Provide surplus adult to Tribal programs for out-planting.

Task 2.4.3: Monitor health and disease status of fish, following the Service Fish Health Policy and Integrated Hatchery Operation Team (IHOT) Guidelines.

Goal 3: Assure that all the requirements of legal orders and federally mandated legislation are met.

Objective 3.1: Conduct hatchery operations consistently with requirements and obligations called for under the ESA.

Task 3.1.1: Develop and implement plans to release adult fall chinook that enter the ladder immediately back into the Clearwater River.

Task 3.1.2: Mass mark all production fish to identify them from naturally produced fish.

Task 3.1.3: Implement measures to produce juvenile fish that are fully smolted and ready to emigrate (reduce residualism).

Task 3.1.4 Implement measures to minimize interactions between production and natural fish.

Task 3.1.5: Draft and implement a Hatchery and Genetic Management Plan.

Objective 3.2: Operate the hatchery so that all requirements and obligations called for under the Clean Water Act are satisfied.

Task 3.2.1: Collect and store on site, fish waste from clarifiers and biofilters.

Task 3.2.2: Collect and analyze water samples monthly in accordance with the NPDES permit.

Objective 3.3: Assure that hatchery operations support Columbia River Fish Management Plan (U.S. v Oregon) production and harvest objectives.

Task 3.3.1: Provide pertinent data and information to Service representatives on U.S. v Oregon Production Advisory Committee (PAC) and Technical Advisory Committee (TAC) meetings.

Task 3.3.2: Meet tribal trust responsibilities.

Goal 4: Provide accurate information and educational (I/E) opportunities for the public, media, schools, Tribal, State, and Federal agencies, and elected officials to enhance participation in understanding and stewardship of Dworshak NFH and FWS programs.

Objective 4.1: Provide production and evaluation information in various reporting formats as necessary or required.

Task 4.1.1: Continue existing and develop new partnerships with public and private groups by being available for guest speaking at their meetings, workshops and other routine or special events.

Task 4.1.2: Develop and maintain strong relationships with area media (Orofino, Kamiah, Grangeville, Lewiston, Spokane) and provide regular news releases, feature stories, photos, data, public service announcements regarding agency issues and station activities.

Task 4.1.3: Maintain information flyers on station for after-hours visitors.

Task 4.1.4: Coordinate with other Outreach or Public Affairs offices to incorporate hatchery information in their programs.

Task 4.1.5: Maintain hatchery website with accurate and frequently updated information and graphics.

Objective 4.2: Develop new and maintain existing levels of public contact and education programs, both on- and off-site.

Task 4.2.1: Facilitate interagency cooperation with existing and new programs in the Clearwater/Snake River region.

Task 4.2.2: Evaluate use and exposure of outreach materials and exhibits as they support goals for the I/E hatchery program.

Task 4.2.3: Distribute and follow up with teacher evaluations post-program to ensure goals are met.

Objective 4.3: Develop site keynote events to promote awareness and stewardship of regional fishery resources in support of National Fishing Week activities.

Task 4.3.1: Continue hosting annual Kids' Fishing Day/Open House event each June.

Task 4.3.2: Interact with other state and federal agencies to host or partner present special events such as National Wildlife Refuge Week, Earth Day, Lewis and Clark Bicentennial activities, regional and local events.

Task 4.3.4: Develop more hands-on interactive education for current special events on-site.

Objective 4.4: Develop external partnerships with new and existing private, non-profit and special interest groups and local, regional and national organizations, institutions and agencies, to promote public awareness and stewardship of fishery resources in the Columbia River Basin.

Task 4.4.1: Promote special interest group's use of hatchery by inviting to tour.

Task 4.4.2: Interact with Regional Office, Idaho Fish Health Center (FHC), Idaho Fishery Resource Office (FRO), IDFG, Clearwater National Forest (NF), National Oceanic and Atmospheric Administration (NOAA), COE and National Marine Fisheries Service (NMFS) to integrate Lower Snake, Clearwater and Columbia Basin fisheries outreach activities with FWS regional and national strategies.

Task 4.4.3: Participate in local advisory or community outreach forums and groups.

Task 4.4.4: Hold bi-annual public informational meetings to discuss hatchery practices, projects and program issues, concerns and plans.

Task 4.4.5: Provide annual legislative briefing packet distribution to Idaho elected officials; invite them to visit the hatchery during peak spawning seasons.

3.2 Current Practices to Achieve Goals and Objectives

3.2.1 Water Use and Management. Dworshak NFH consists of a mechanical and electrical water reuse and reconditioning system employing filtration, biological nitrification, pollution control and monitoring facilities, alarm system, water chillers, heaters, and numerous pumps. Initial construction at DNFH included 84 BP's, 64 nursery tanks, and 9 adult holding ponds (Figure 2). Twenty-five BP's (System I) were operated on a heated recycle water flow, for rearing steelhead smolts to the initial target size of 180 mm in only one year. In 1973, System II (25 ponds) and System III (34 ponds) were converted from a single-pass, 2-year rearing cycle, to water reuse and heating for accelerated production growth. This second phase of construction, with added mechanical systems (biological filters, electric grid, sand filters, U.V. lamps, chillers, and boilers), increased production capacity and allowed all three water systems to be environmentally controlled.

Further construction in the late 1970's and early 1980's added 18,000 square feet of nursery building, doubling the number of inside rearing tanks to 128. In FY2001 there were 58 incubator stacks available (870 trays).

Also in the 1980's, five of the nine adult steelhead holding ponds were converted to raceways in order to rear rainbow trout as part of the resident fish mitigation program for Dworshak Reservoir. In 1997 these were converted into coho rearing ponds for the NPT.

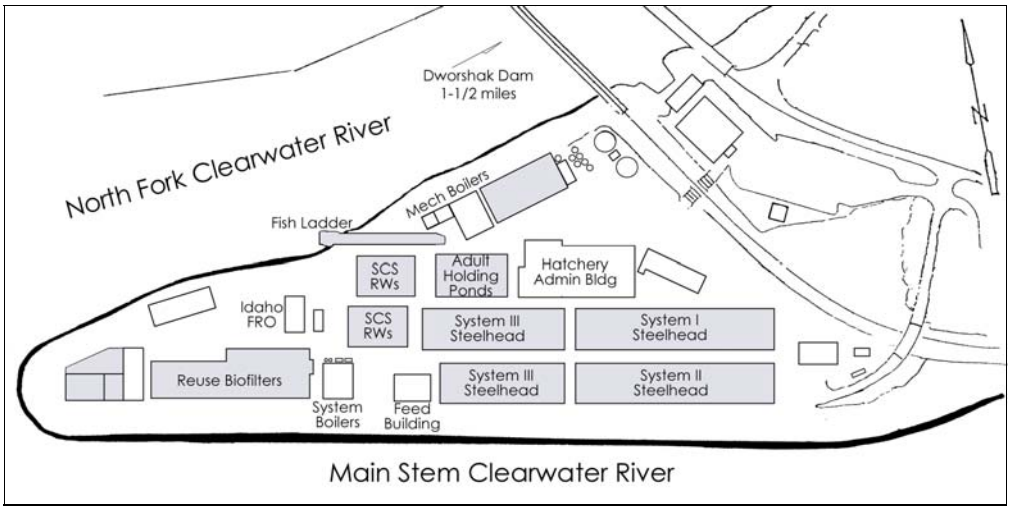

Figure 2. Dworshak National Fish Hatchery.

Current reservoir supply needs for Dworshak NFH include separate warm and cold reservoir supply lines into the hatchery. Because of the two species—steelhead and spring chinook salmon—both warm and cold water is needed at the same time for various rearing and incubation needs. Two temperature options (54˚F and 43˚F) are available for egg development in half of the incubators and for fry development in a limited number of the tanks in the nursery.

In all the outside steelhead rearing systems, water reuse and heating is used during the colder months of November through March, enabling the hatchery to obtain programmed fish growth. During reuse, 10 percent new water enters the operation to make up for various water losses in each system. Each of the three outside ponding systems is independent of the others for temperatures when reuse and heated water are available.

3.2.2 Screening. Three large traveling water screens are installed in the main pump house. These screens are installed behind trash racks. The traveling water screens remove small debris that could cause damage to the six main pumps that supply river water to the hatchery. The screen is stainless steel wire mesh with a 3/8-inch square opening. The trash rack has a 2-foot by 3-inch opening. The screens are backwashed daily using high-pressure water. This is normally done manually but can be done by a timer and/or a pressure regulator.

The maintenance crew takes care of the screens Monday through Friday. The production crew takes care of the screens on weekends and holidays. The screens operate all year depending upon water requirements and pumping needs for fish production. Normally, there are at least two main pumps in use at all times. Routine maintenance includes lubricating various components on a scheduled time and daily inspections. All three screens were completely rebuilt in 1999 and 2000.

3.2.3 Conveyance System to Hatchery and Ponds. River water is pumped to the outside

steelhead ponds, providing single-pass water from May through November. When desired, changes in temperature can sometimes be obtained through selector gates at Dworshak Dam. A pump station on the North Fork of the Clearwater River, one mile down river from the Dam, is capable of providing 92,500 gpm of water for the hatchery. With all systems up and running, the intake for Dworshak is 136 million gallons of water/day.

Beginning in November of 1991, the hatchery was supplied with an additional 6,400 gpm of gravity flow Dworshak Reservoir water directly by pipeline. This relatively clean water supplies egg incubators and nursery rearing tanks and has afforded disease protection from IHNV in the early production stages.

Supply lines from the dam come to a distribution box (42-inch diameter warm water and 24-inch diameter cold water). From the distribution box to Dworshak NFH, there is a 24-inch diameter warm water supply line and a 14-inch diameter cold water supply line. The two reservoir supply lines enter Dworshak NFH at a valve pit where they join and continue into a 30-inch diameter supply line. This supply line was an existing line from the main aeration chamber and supplies water to the Nursery building and Mechanical buildings I and II. The water can be heated in Mechanical building I and II or chilled in the incubation room.

During 1998, a water line was completed between Mechanical Building I and the main water line from the large boilers in Mechanical Building II. This line now enables Dworshak to heat all the nursery reservoir water (5,100gpm) to 54˚F for better steelhead production. Chilled water is less than 100 gpm at 44–45˚F and is limited to half of the incubation room.

3.2.4 Effluent Treatment and monitoring. The incubation room has single-pass reservoir water with three temperatures available: heated, chilled, and ambient. Water from the incubation room drains into the outside raw water channel that supplies the holding ponds and the storm drain that discharges into the North Fork below the ladder. Except for screening for eggs in the spawning area, there is no treatment for the water leaving the incubation/spawning area.

The nursery room receives single-pass reservoir water. There are four banks of nursery tanks with 32 tanks in each bank. Each bank has a separate water supply. A-Bank can receive heated water from Mechanical Building I. All four banks can receive heated water from the ozone system. The heated water is limited; 1,200 gpm to A-Bank and 1,000 gpm from the ozone system. The wastewater from the Nursery building goes through two clarifiers before discharging to the North Fork.

System I consists of 25 BP's that can be operated on single-pass river water or on reuse. The reuse system was rehabilitated in 2003 and put back into operation in 2004. All cleaning wastes can go to six clarifiers prior to being discharged into the North Fork. Under re-use, all waste water goes through the bio-filter system. Non-cleaning water can be discharged into the mainstem Clearwater River.

System II consists of 25 BP's that can be operated on single-pass river water or on reuse. Even though this system has a raw water channel and a reuse channel, cleaning wastes cannot go to the

biofilters when the system is operated on raw water. Cleaning wastes do go to the biofilters when

operating on reuse. Raw water is discharged to the mainstem Clearwater River.

System III consists of 34 BP's that can be operated on single-pass river water or reuse. Cleaning wastes go to the biofilters when operating on reuse but not when operating on raw water. Raw water is discharged to the mainstem Clearwater River.

There are 30 8'x80' concrete raceways for the spring chinook salmon program, 15 in A-Bank and 15 in B-Bank. Raceways are operated on single-pass river water. Cleaning wastes go to a settling pond on the point at the confluence of the rivers prior to being discharged into the North Fork.

There are 10 raceways in the adult holding pond area that were built for rearing rainbow trout. These raceways can be operated on single-pass river water. Cleaning wastes and the raw water are discharged into the North Fork.

There are four adult holding ponds. These ponds and the ladder are operated on single-pass river water. Raw water is discharged to the North Fork. No cleaning wastewater treatment is conducted for this system.

3.3 Brood Stock Management - Summer Steelhead (SST)

The following performance measures have been established at the hatchery:

Performance Measure	Hatchery Goal	5-Year Average	Range
Spawning Population	3,500	5,222	2,882–7,797
Fish release (millions)	2.1–2.3	2.16	2.11–2.21
Egg transfers (millions)	2.30	2.93	2.65–3.65
Smolt size at release (mm)	200	198	192–205

Dworshak NFH operates a fish ladder at its facility to capture returning Clearwater River "B" run steelhead. No summer steelhead are trapped and transferred to Dworshak NFH from outside of the basin. Dworshak operates the adult fish trap to capture SST from the entire spectrum of the run. This includes the adult returns to Dworshak in fall of the year (October–December), and the winter and spring (February–May). Collecting adults from the time they begin to appear at Dworshak until the run is over insures that genetic differences attributable to run timing are included in the broodstock.

Dworshak operates the adult fish trap each fall to capture summer steelhead which enter the hatchery area several months before spawning begins. The ladder is usually opened near October 1 each year, and remains open until either 500 summer steelhead are captured or cold weather

interferes with steelhead entering the ladder. In years past, the time the ladder was opened to

collect the target number ranged from a few days to three months, depending upon the size of the run and various other factors.

After 500 adults are trapped in the fall, the ladder remains closed until February. This ladder closure results in more fish available to the sport and tribal fishery in the Clearwater River Basin. Steelhead which are trapped in the fall of the year are held in a separate adult holding pond. These fish are also spawned separately from the middle and late returning SST. Normally, these early-return fish are spawned the first three weeks of February each year. The eggs from each take are kept separate from each other. As the eggs hatch, each take is kept separate from the other throughout both nursery and outside rearing until release. Approximately 400,000 smolts, or about 20 percent of the smolts released at Dworshak, will be progeny from these early return adults.

3.3.1 Surplus Adult Returns. Surplus adults entering the hatchery are usually outplanted to various locations in the Clearwater basin. Excess adults may also be donated to the NPT or Coeur d'Alene Tribe for subsistence use. Adult carcasses are used primarily for the food bank program and inmate rations in the State Prison System. Carcasses which are unfit for human consumption are used for Washington or Idaho State bear research/capture programs, university research, raptor recovery and rehabilitation programs, or stream nutrient enhancement programs.

3.3.2 Spawning Protocol. Spawning usually begins the first week in February and ends the first week of May. Adult SST are pushed by mechanical crowders from holding pond (HP) 9 into a channel, moved into a channel basket, and placed into an anesthetic bin. Ripe fish are spawned for either Dworshak NFH or IDFG hatcheries. Excess ripe fish will be transferred to another HP for outplanting. Green fish will either be outplanted or transferred to another HP for later spawning. Whenever possible, fish just coming up the ladder and trapped in HP 9 will be spawned exclusively. Fish that have CWT's will be either spawned or killed for tag recovery.

The fish are anesthetized with carbon dioxide at a rate of 400 to 1000 mg/l solution buffered with 8 to 10 pounds of sodium bicarbonate. Although carbon dioxide (CO_2) as an anesthetic appears more stressful on the fish than MS-222, carcasses anesthetized with CO_2 can be used for human consumption. Oxygen is provided at a rate of one l/minute. Spinal columns of ripe females are severed using a pneumatic knife. The females are placed on a table for 5–15 minutes for blood drainage. The ventral side is cut open using a spawning knife and eggs are collected in disinfected colanders. After ovarian fluid is drained, the eggs are poured into a clean bucket.

Milt from ripe males is stripped into Styrofoam cups, and a one-percent saline solution is added to assist in milt motility. The milt solution is poured onto the eggs and swirled to aid in more complete fertilization. After sufficient time has elapsed for fertilization to take place (one to two minutes), the eggs are rinsed of sperm, blood, and other organic matter.

After rinsing, eggs are placed in Heath incubator trays at approximately 6,750 eggs per tray (one female). In each tray is a 75 mg/l iodophor solution buffered with sodium bicarbonate. Eggs are maintained in this solution for approximately 30 minutes. This is done as a precaution against disease transmission. The egg trays are then pushed into the incubator stack, flushing the iodine.

Water flow rate is approximately five gallons/minute and temperature will average approximately 54ºF. Formalin treatments are administered five days per week to control fungus on the eggs.

Female SST returning to Dworshak usually outnumber males 2.3:1 in return-ratio. Ideally, 3,500 adult steelhead returning to Dworshak are needed to come close to a 1:1 male:female spawning ratio and fulfill the entire egg production needs for Dworshak NFH and IDFG programs. Although Dworshak can usually take a full program of eggs with less than 3,500 adults returning, the spawning ratio of males:females drifts away from the ideal 1:1 as fewer fish return. Maintaining as close to a 1:1 male:female spawning ratio will be continued at Dworshak during upcoming spawning seasons.

As steelhead are spawned throughout the 14-week spawning season at Dworshak NFH, the first fish which are ripe when examined will be used until the target egg numbers are reached for any given week. Ripe adult SST of any and all ages are used, including two-year-old males and females. The majority of fish spawned are 3–4 years old, with some 5 years old fish being utilized.

3.3.3 Other Acceptable Stocks. If brood stock numbers are insufficient to meet hatchery production objectives, the hatchery will use the hatchery summer steelhead trapped at Kooskia NFH, since these fish are Dworshak stock from Dworshak NFH.

3.3.4 Incubation Strategies and Procedures. Approximately 2.7 million eyed eggs are put into Dworshak's SST program. Upon eye-up (approximately 15 days after fertilization at 54ºF), the eggs will be shocked. The next day the eggs will be enumerated and sorted using an electronic egg picker and counter (Van Gaalen Model -100). Eggs are then placed into hatching jars in the nursery. Due to space constraints in the nursery, eggs from Takes 12–14 are enumerated and returned to Heath trays (4,000–6,000 per tray) and hatched in the trays. Once Takes 1 and 2 are moved from the nursery to outside ponds, fry from Takes 12–14 are moved into these vacated nursery tanks. The water flow is maintained at approximately five gpm in both the trays and jars. The hatching jars drain into 680-gallon rectangular nursery tanks. As the fry swim up in the jars, they flow into these tanks for initial rearing.

3.3.5 Rearing Strategies. The nursery at Dworshak NFH contains 128 tanks with a volume of 680 gallons/tank. Steelhead are stocked at an initial density of approximately 17,000 fry/tank. The fry are reared in these tanks for approximately 3½ months, until they reach a size of about 85 fish per pound. At this time, the 3-inch fingerlings are transferred to outside BP's for final rearing until release.

Dworshak has 84 BP's, which have a volume of 22,000 gallons/pond. Steelhead fingerlings are stocked at a rate of 25,000–33,000 fish/pond. The fingerlings receive an adipose fin clip as they are moved outside the nursery to mark them as hatchery fish. Approximately 2.2–2.3 million SST fingerlings are moved from the nursery to outside ponds each summer. The SST are reared part of the year on reuse water, heated to approximately 52ºF in the winter. Although fish health can deteriorate while the fish are on reuse, the heated water is necessary to obtain a 200mm smolt by release time

3.3.6 Release Strategies. Steelhead at Dworshak are typically released during high flows in April. About 1.1 million smolts are released directly from Dworshak NFH into the mainstem of the

Clearwater River. There are also about 1.1 million SST smolts that are trucked upstream approximately 35 miles for release in the South Fork of the Clearwater River.

3.4 Brood Stock Management -Spring Chinook Salmon (SCS)

The following performance measures have been established at Dworshak NFH:

Performance Measure	Hatchery Goal	5-Year Average	Range
Spawning Population	1,200	2,218	800–4,018
Fish release (millions)	1.00–1.05	873,893	333,120–1,044,511
Smolt size at release (fish/lb)	20–22	21	19.7–24.0

Dworshak operates a fish ladder at its facility to capture returning adult SCS. The ladder is usually opened for SCS collection from late May through mid-September.

The SCS carcasses are unfit for human consumption and can be used for Washington or Idaho State bear research/capture programs, university research, raptor recovery and rehabilitation programs, or stream nutrient enhancement programs. The remainder of the carcasses are taken to an area waste-transfer station.

Because the run of spring Chinook salmon to Dworshak NFH is relatively short most years, especially compared to the steelhead return, the ladder is generally opened in June and operated all summer until closing in September. In most years, running the trap continually is necessary in order to ensure that broodstock is collected over the full spectrum of the run. In those years when returns are sufficient to provide sport and tribal harvest opportunities, the ladder may be closed for brief periods during the summer.

3.4.1 Surplus Adult Returns. Surplus adults entering the hatchery are usually outplanted to various locations in the Clearwater basin.

3.4.2 Spawning Protocol. As chinook are spawned throughout a 3–5 week spawning season, fish which are ripe when examined are used for the production program. Ripe adult SCS of any and all ages are used, including two-year-old males and females. The majority of fish spawned are 3–4 years old, with some 5 years old fish being utilized.

The spawning procedures are similar in recent years. Tricaine methanesulfonate (MS-222) is used for spawning purposes for the easiest handling of the fish. Adults are crowded from the holding ponds into a crowding channel, moved into a channel basket, and placed into an anesthetic bin. Pro-Polyaqua is added (250 ml per bin) to reduce stress and susceptibility to infection. Oxygen is provided at a rate of 1.5 L/minute.

Spinal columns of ripe females are severed using a pneumatic knife. The females are then placed on a table for approximately 3–10 minutes for blood drainage. The ventral side is then cut open

using a spawning knife and eggs are collected in disinfected colanders. After ovarian fluid is drained, the eggs are poured into a clean bucket.

Milt from ripe males is stripped into Styrofoam cups and a one-percent saline solution added to assist in milt motility. The milt solution is poured onto the eggs and swirled for more complete fertilization. After sufficient time had elapsed for fertilization to take place (one to two minutes), the eggs are rinsed of sperm, blood, and other organic matter.

Green males and females are returned to holding ponds for examination the following week.

After fertilization, eggs from one female are placed in Heath incubator trays. In the tray is a 75 mg/l iodophor solution buffered with sodium bicarbonate. Eggs are maintained in this solution for approximately 30 minutes as a precaution against disease transmission. The trays are then pushed into the incubator with a water-flow rate of approximately five gallons/minute. Eggs in banks A/B are chilled to approximately 40ºF. Since the chiller has the capacity to only chill two incubator stacks, eggs in C/D bank incubators are held at approximately 45ºF.

3.4.3 Other Acceptable Stocks. If brood stock numbers are insufficient to meet hatchery production objectives, the hatchery will accept surplus eggs or fish from either Kooskia NFH or another LSRCP facility that has Rapid River stock.

3.4.4 Incubation Strategies and Procedures. Eye-up of eggs on 45ºF water takes place approximately 43 days after spawning. Eye-up of eggs on chilled water (40ºF) takes place approximately 70 days after spawning. Upon eye-up, eggs are shocked and enumerated using an electronic egg picker and counter (Van Gaalen Model N-100).

From 1996 through 2002, all Dworshak stock SCS eggs have been shipped to Kooskia NFH. This has been done after the eggs were eyed-up and enumerated at Dworshak NFH. Eyed eggs were then
transferred to Kooskia NFH in lots of 5,000 a few days after enumeration, usually in October/November. Eggs are transferred inside of Vexar tubes packed inside of ice chests.

The use of 38ºF chilled water at Kooskia NFH all winter allows for slowing the rate of development in the eggs so that smolts will be a target size of 20–22 fpp at release in the spring of 2004. This delay in egg development is undertaken to reduce the length of the chinook feeding program from 17 months to 14 months. With this shortened feeding program, chinook require fasting for a shorter period of time than if the incubation water were not chilled.

3.4.5 Rearing Strategies. Chinook eggs which are shipped to Kooskia NFH in the fall return as fry to Dworshak NFH in March and April of the following year. These fry are shipped just before going on feed and are usually transferred inside of incubation trays submerged in a fish-hauling tank. The fry are loaded at approximately 100,000 fry/raceway and later split to a final rearing density of 30–35,000/raceway. Splitting of the chinook occurs when fish are adipose-fin clipped and coded wire tagged in the summer.

3.4.6 Release Strategies. Chinook are reared until reaching about 20 fish per pound in size and are released during spring run-off. Release of SCS at Dworshak NFH usually occurs at the end of

March each year. The fingerlings are direct-released into the North Fork of the Clearwater River, approximately 1½ miles downstream of Dworshak Dam.

3.5 Fish Health Management Program

The primary objective of fish health management programs at Service hatcheries is to produce healthy smolts that will contribute to the program goals of that particular stock. Equally important is to prevent the introduction, amplification or spread of certain fish pathogens which might negatively affect the health of both hatchery and naturally reproducing stocks.

3.5.1 Fish Health Policy. The Idaho FHC located in Ahsahka, Idaho, provides fish health care for Dworshak NFH under the auspices of the published policy 713 FW in the Fish and Wildlife Service Manual (FWM). In addition to this policy the 1994 annual report, *"Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries"* (IHOT 1995) provide further fish health guidelines as approved by northwestern state, federal, and tribal entities. The directives of these two documents more than meet the requirements of Idaho's state and Tribal fish health entities.

The documents mentioned above provide guidance for preventing or minimizing diseases within and outside of the hatchery. In general, movements of live fish into or out of the hatchery must be approved in the U.S. v. Oregon Production Advisory Committee forum (Objective 6). Before a fish transfer or release can occur, permits from the IDFG, the Service, and any other states through which the fish travel, must be obtained and approved. Fish health examination and certification must be done prior to any releases or transfers from the hatchery to minimize risks from possible disease transmittance.

3.5.2 Fish Health Examinations. The Idaho FHC conducts several types of fish health exams. Examinations of both summer steelhead and spring Chinook salmon are conducted at Dworshak NFH by a pathologist from the Idaho FHC once per month. From each stock and broodyear of juveniles, fish are randomly sampled to ascertain general health. Based on pathological signs, age of fish, concerns of hatchery personnel, and the history of the facility, the examining pathologist determines the appropriate tests. This usually includes a necropsy with an external and internal exam of skin, gills, and internal organs. Kidneys (and other tissues, if necessary) are checked for the common bacterial pathogens by culture and by a specific test for bacterial kidney disease (BKD). Blood is checked for signs of anemia or other infections, including viral anemia. Additional tests for virus or parasites are done if warranted. The pathologist will also examine fish that are moribund or freshly dead to ascertain potential disease problems in the stocks.

Diagnostic examinations are performed on an as-needed basis as determined by the pathologist or requested by hatchery personnel. Moribund, freshly dead fish or fish with unusual signs or behavior are examined for disease using necropsy and appropriate diagnostic tests. A pathologist will normally check symptomatic fish during a monthly examination.

Pre-release examinations are conducted two to four weeks prior to a release or transfer from the hatchery. Routinely, 60 fish from the stock of concern are necropsied and tissues taken for testing of listed pathogens. The listed pathogens, defined in Service policy 713 FW (Fish and Wildlife

Service Manual) include IHNV, infectious pancreatic necrosis virus (IPNV), viral hemorrhagic septicemia virus (VHSV), Renibacterium salmoninarum, Aeromonas salmonicida, Yersinia ruckeri, and Myxobolus cerebralis.

Adult certification examinations are performed during spawning. Tissues from adult fish are collected to ascertain viral, bacterial, and parasite infections and to provide a brood health profile for the progeny. The Idaho FHC tests for all of the listed pathogens, including Myxobolus cerebralis and Ceratomyxa shasta. The minimum number of samples collected is defined by 713 FW. At Dworshak NFH, all brood SCS females are tested for R. salmoninarum (causative agent of BKD), with an identifying fish health number corresponding to each female's eggs so that selective culling and/or segregation is possible. This is done to reduce/control BKD, a vertically transmitted disease. Progeny from females with high levels of BKD are culled (if not needed to make production goals) or segregated from progeny at lower risk. The Idaho FHC provides results from testing within four weeks to allow management decisions. A random sample of 60 adult steelhead is also tested for BKD by ELISA.

3.5.3 Chemotherapeutant Use. Erythromycin injections for SCS brood stock are critical to the control of BKD, which is caused by a vertically transmitted bacterium (Renibacterium salmoninarum) that can reside in the ovarian and seminal fluids. In addition, erythromycin injections control the mortality and reduce horizontal transmission of BKD between adults in the holding pond. The injection schedule is set to maximize the number of adults injected, with a goal of one injection 21 days prior to spawning.

To reduce bacterial numbers in the reproductive fluids, and to deposit the drug inside the ova, erythromycin must be injected at a dosage of 20 mg drug/kg of fish. At Dworshak NFH, the first injection is scheduled on about July 29th. Except for fish arriving too close to the time of spawning for safe handling and injection, all spring chinook salmon adults kept for broodstock are injected.

Injections are done under a prescription from a veterinarian. The injected drug is Gallimycin 200 (200 mg/ml), of active erythromycin base in a non-aqueous buffered alcohol base; to be injected into the peritoneal cavity at 20 mg drug/kg of body weight.

Since 1998 (brood year 97 juveniles) prophylactic medicated feedings to control BKD in juveniles has been deemed unnecessary. The reduced levels of BKD in the juveniles is attributed to lowered densities (< 0.25 density index and < 1.0 flow index) during rearing, regular cleaning and maintenance of individual equipment (nets, etc.) for each pond, erythromycin injection of the adults, and culling/segregation of progeny from highly infected females.

Should prophylactic feeding be necessary juveniles are fed at a daily dosage of 100 mg/kg of fish for a minimum of 21 days, unless contraindicated by drug toxicity or needed feeding rate adjustments. The time and number of treatments will be dictated by circumstances. As of 2001, there is a temporary INAD 4333 that allows feeding of Aquamycin 100 (erythromycin thiocyanate in a wheat flour base).

Adult spring Chinook salmon held for brood stock are treated with formalin up to three times per week to control external pathogens prior to spawning.

Salmonid egg hardening and disinfection treatment with a polyvinylpyrrolidone iodine compound

(approximately 1% iodine) is required by 713 FW policy to minimize/prevent transmittance of viral and bacterial pathogens. The eggs are disinfected in 75 ppm iodine in water buffered by sodium bicarbonate (at 0.01%) for 30 minutes during the water-hardening process. Eggs received at the hatchery must be disinfected before they are allowed to come in contact with the station's water, rearing units or equipment. Specifics are provided in 713 FW policy.

3.5.4 Other Fish Health Precautions. Unless knowledge regarding vertical transmittance of BKD proves otherwise, eggs from female brood stock with high levels of BKD (a cut-off point selected by the NFH and FHC managers based on results from the Enzyme-Linked Immunosorbent Assay or ELISA) will not be used in production except when egg production is low. If the number of brood females is low, progeny from highly infected females shall be segregated into rearing units apart from the rest of the production and with all equipment being disinfected and/or dedicated to these segregated rearing units.

Returning SCS that are allowed to remain in the North Fork of the Clearwater River upstream of the hatchery can serve as a reservoir of pathogens for the fish in the hatchery. Returning spring Chinook salmon have a relatively low incidence of IHNV. The risk from BKD in the juveniles is also enhanced, with evidence from this and other hatcheries, that horizontal transmission occurs when infected adults are in the water supply.

Drugs and chemicals for treating fish are used on an "as needed" basis. Formalin treatments for adult brood stock are given to control external parasites and as a fungicide on eggs.

Tank trucks and tagging trailers are disinfected before being brought onto the station and after use at the hatchery.

Abernathy Fish Technology Center provides quarterly feed quality analysis to prevent disease and meet nutritional requirements of fish.

3.6 Monitoring, Evaluation, and Coordination

The Idaho FRO provides monitoring, evaluation, and coordination services for the Dworshak Fisheries Complex. The Idaho FRO staff monitors hatchery returns, measures biological characteristics of the hatchery stock, coordinates fish marking, performs tag recovery, and assists with other aspects of the hatchery program. They maintain databases that store this information and provide data to databases maintained by other entities. The Idaho FRO also provides leadership for the Dworshak HET, which ensures close cooperation and coordination between Dworshak NFH, Idaho FHC, the Idaho FRO and our co-managers, to evaluate fish culture practices, assess impacts to native species, and coordinate hatchery programs both locally and regionally. These activities are described in the following section:

3.6.1 Database Management. All national fish hatcheries submit distribution data to the fisheries information system (FIS) which is the Service's national database. Dworshak NFH submits distribution, lot history, and adult return information to the Idaho FRO. After review, these files are sent to the Columbia River Fisheries Program Office (CRFPO) for incorporation into the Columbia River information System (CRiS). Marked release and recovery information is sent to the Fisheries

Division of the Western Washington Fish and Wildlife Office for conversion to the Pacific States Commission / Pacific States Marine Fisheries Commission format. In addition, the Idaho FRO maintains complete databases of all hatchery information within the office to provide summary data to other State, Federal, and Tribal agencies.

3.6.2 Marking/Tagging Program. Dworshak NFH releases about 1.0 million spring chinook salmon smolts each year. Since 1993 all of the spring chinook salmon smolts at Dworshak NFH have had the adipose fin removed as a mass mark to identify them as hatchery fish. The mark facilitates selective fisheries and evaluation of wild populations in some areas. In addition to the adipose fin clip, at least two groups of 60,000 fish receive a CWT to represent the two separate banks of LSRCP raceways. Since 1996, the spring chinook salmon program at Dworshak NFH has cooperated with the NMFS in the Comparative Survival Study by providing in excess of 50,000 smolts per year for PIT-tagging. The smolts are released at Dworshak NFH and provide information on survival during emigration to the ocean as well as Transported vs. Non-Transported adult survival back to the river from the ocean. For the past several years, the adult PIT tag information has been used by the fishery management agencies and the hatchery to construct in-season estimates of harvestable surpluses of chinook salmon not needed for broodstock.

Dworshak NFH releases nearly 2.2 million summer steelhead smolts each year. From 1983 to 2000, all the summer steelhead smolts released from Dworshak NFH were adipose fin clipped to identify them as hatchery fish. In 2000, the Service entered into an agreement through U.S. v Oregon to release 100,000 unclipped steelhead smolts marked with blank CWT's. Depending on future management decisions by the U.S. v Oregon parties, unclipped steelhead smolts may or may not continue to be released from Dworshak NFH. Of the remaining steelhead smolts released annually, seven (7) groups of 20,000 fish each or 140, 000 are coded-wire tagged and receive a left ventral fin clip. These marked groups provide the opportunity to evaluate various aspects of the production program such as the various rearing systems, release sites, size at release, and return timing of adults. In addition, about 1,500 are PIT-tagged to monitor emigration. All marking and tagging is in compliance with ESA requirements.

3.6.3 Bio-sampling and reporting. The Idaho FRO is responsible for sampling all adult SST and SCS that return to Dworshak NFH. Fish are measured for fork length, checked for CWT's, PIT tags, fin clips and other distinguishing marks, and when possible identified as either male or female. Mark recovery information is used to report success of that production year in terms of smolt to adult return rates. Where groups of smolts were marked to represent various treatment groups of an evaluation study, the data are used to draw conclusions and make recommendations. Final reports are made available to other Service offices, other agencies, and the general public as requested. In addition, marked adults have been used to help separate different runs at the dams in order to adjust harvest.

3.6.4 Hatchery Evaluation Studies. The Hatchery Evaluation Vision Action Plan, developed in 1993 for Region 1 Fisheries, describes hatchery evaluation in greater detail (USFWS 1993). The purpose of hatchery evaluation studies are to simply determine what works and what doesn't work through planning, implementing, documenting, monitoring, analyzing, and reporting.

A number of evaluation studies have been conducted at Dworshak NFH in past 20 years. Recent

studies include: 1) An evaluation of rearing density of spring chinook salmon; 2) An evaluation of the effects of various fish cultural methods on the size variability of summer steelhead; 3) An evaluation of various methods of marking and tagging adult spring chinook salmon and steelhead for broodstock management; 4) A comparison of three dry starter feeds on the growth of juvenile summer steelhead; 5) A comparison of release time on downstream emigration success and adult returns of spring chinook salmon; and, 6) Manipulation of growth rate and use of enhanced diets to stimulate smoltification in summer steelhead. Results from these and other studies have been used to refine hatchery management and fish culture at Dworshak NFH

3.6.5 Stock Assessment and Contribution to Fisheries. Dworshak NFH began production releases of summer steelhead in 1970. CWT groups of summer steelhead have been released every year since 1977, with the exception of 1985. Numerous marked groups have been released to monitor the program, including many evaluation studies.

A summary of the CWT release groups is provided in **Table 1**. Note: Although tag group size is targeted for 20,000 fish per group, mortality prior to release reduces the number significantly in some years. CWT's have been used to monitor adult returns and contribution to fisheries as well as to test differences in experimental treatment groups for various special studies. Summer steelhead from Dworshak NFH contribute primarily to sport and Tribal fisheries in Clearwater River although they are also harvested in various fisheries in the lower Columbia and Snake Rivers.

Monitoring and evaluation of the spring chinook salmon program at Dworshak NFH was started in 1986 with the release of the first CWT groups. Since that time, groups of spring chinook have been tagged and marked for various evaluations every year. Coded wire tagging has been used to evaluate adult returns for production monitoring and specific evaluation projects. A summary of the coded wire tag release groups is provided in **Table 2.** Note: Although tag group size is targeted for 60,000 fish per group, mortality prior to release reduces the number significantly in some years.

In recent years, specific evaluation projects have not been conducted, and coded wire tagging has been used only for evaluating progress towards meeting the mitigation goal of 9,135 adults to Lower Granite Dam. Spring chinook salmon from Dworshak NFH have contributed to limited sport and Tribal fisheries in the Clearwater in years when returns have been high. Very few contribute to fisheries in the lower Columbia and Snake Rivers.

All release information, including marked to unmarked ratios, is reported to the Pacific States Marine Fisheries Commission (PSMFC). Mark and tag information from sampled fish recovered in the various fisheries and at the hatchery, are also reported.

Table 1. Summary of the number of coded-wire tagged summer steelhead released annually from Dworshak NFH from 1977 to 2000.

Release Year	Number of Tag Groups	Number of Tagged Fish Released	Tag Group Sizes at Release (1,000s)	Size Range at Release (FPP)
1977	6	194,418	17–57	8–9
1978	3	194,725	34–100	7–10
1979	3	98,750	27–43	8–12
1980	4	195,300	40–59	6–9
1981	4	160,150	38–41	8–9
1982	12	417,429	29–43	5–9
1983	12	368,433	25–33	5–7
1984	3	117,175	37–40	6–7
1985	0	0	0	0
1986	4	121,300	23–50	5–8
1987	8	168,775	19–26	4–8
1988	10	218,724	14–45	5–9
1989	7	155,685	17–33	5–6
1990	6	83,844	20–21	6–8
1991	7	140,805	20–21	5–7
1992	6	122,506	20–21	5–6
1993	11	224,243	16–22	6–10
1994[1]	12	140,198	0–20	4–7
1995	14	472,802	18–22	5–9
1996	14	286,608	18–24	5–9
1997	14	295,179	20–22	5–8
1998	11	207,048	16–21	4–9
1999	11	205,488	16–22	5–9
2000	12	264,109	20–24	5–7

Source: Idaho Fishery Resource Office database.

[1] One group represented wild steelhead progeny that all died. The data is reported in the PSMFC database.

Table 2. Summary of the number of coded-wire tagged spring chinook salmon released annually from Dworshak NFH from 1986 to 1998.

Release Year	Number of Tag Groups	Number of Tagged Fish Released	Tag Group Sizes at Release (1,000s)	Size Range at Release (FPP)
1986	2	82,925	41	20
1987	4	240,075	49–61	17–40
1988	9	567,075	61–64	20–85
1989	9	455,258	20–68	18–77
1990	11	503,748	23–68	15–19
1991	24	697,063	16–53	17–24
1992	22	665,332	14–62	14–21
1993	9	411,357	8–61	12–18
1994	11	655,726	55–66	14–19
1995	10	648,894	60–69	13–15
1996	2	100,775	49	8–12
1997	1	52,495	52	8–16
1998	3	238,616	69–98	19–23
1999	2	140,376	70–71	20–21
2000	2	126,531	61–65	23–24

Source: Idaho Fishery Resource Office database.

3.6.6 Juvenile Monitoring. Juvenile fish at Dworshak NFH are monitored monthly by the hatchery staff to determine changes in size and growth rates. Samples are taken monthly for analysis by the Idaho FHC to determine the health condition of fry, fingerling, yearling and smolts prior to release. Sampling of fingerling fish for tag retention and fin mark quality, prior to release, is conducted by Idaho FRO.

PIT-tagging summer steelhead was begun in 1988 to monitor travel time and survival of smolts to the Lower Snake and Columbia River dams after release from the hatchery. The hatchery has worked closely with the Fish Passage Center since the early 1990s to provide timely in-season emigration data. Groups of summer steelhead representing the various production groups are usually selected for that purpose. Since 1994, evaluation of steelhead production through the Stewardship and Residual Steelhead studies required extensive PIT tagging. A summary of PIT tagging from 1988 to 2001 is presented in **Table 3**.

Table 3. Summary of the number of PIT-tagged summer steelhead released from Dworshak NFH

from 1988 to 2001.

Release Year	Number Released	Project Description
1988	3000	Fish Passage Center (FPC)
1989	3027	FPC /Heritability of Adult Return Time
1990	0	None
1991	3000	FPC /Heritability of Adult Return Time / Rearing Time
1992	4469	FPC / General Production Evaluation
1993	2000	FPC / System Contribution / Early Return Progeny
1994	4539	FPC / Stewardship / Early Return Progeny
1995	5118	FPC / Stewardship / Size at Ponding
1996	5088	FPC / Stewardship
1997	4999	FPC / Stewardship / System Contribution
1998	3497	FPC / System Contribution / Smoltification Enhancement
1999	5509	FPC / Residual Study
2000	6007	FPC / Residual Study
2001	6005	FPC / Residual Study

Source: Idaho Fishery Resource Office database.

PIT-tagging of spring Chinook salmon was started in 1988 but didn't become a significant part of monitoring and evaluations until 1990. Since 1996, Dworshak NFH has been a cooperator in the Comparative Survival Study by providing significant numbers of spring Chinook salmon smolts for PIT tagging. PIT tagging has given us the first indication of success after hatchery releases are made by providing data on travel time and survival to downriver dams. A summary of PIT-tagging from 1988 to 2001 is presented in **Table 4.**

Table 4. Summary of the number of PIT-tagged spring Chinook salmon released from Dworshak NFH from 1988 to 2001.

Release Year	Number Released	Project Description

1988	4,092	Photoperiod Advancement Study
1989	0	0
1990	17,042	Photoperiod Advancement Study / BKD Progeny Evaluation
1991	11,250	Rearing Density / Erythromycin Evaluation
1992	3,101	Rearing Density
1993	4,464	Serial Release
1994	20,400	Serial Release / INAD 4333 Erythromycin Field Trials
1995	3,985	INAD 4333 Erythromycin Field Trials
1996	28,983	FPC / Comparative Survival Study
1997	14,080	Comparative Survival Study
1998	47,740	Comparative Survival Study
1999	47,844	Comparative Survival Study
2000	47,745	Comparative Survival Study
2001	55,142	Comparative Survival Study
2002	54,726	Comparative Survival Study
2003	54,680	Comparative Survival Study

Source: Idaho Fishery Resource Office database.

3.6.7 ESA Assessments, Ecological Interactions, and Natural Production Studies. The Service completes Biological Assessments and Hatchery and Genetic Management Plans to comply with the ESA. These assessments and plans help guide production, considering the potential impacts on the biological community.

To comply with ESA, the Service initiated Biological Assessments (BA) for both summer steelhead and spring Chinook salmon at Dworshak NFH in 1992 and subsequently initiated Hatchery and Genetic Management Plans (HGMP) for Dworshak NFH in 1999. This initial draft HGMP followed an older format and was produced under consultation with NOAA Fisheries to meet ESA Section 7 obligations. The Service and NOAA Fisheries agreed that a more thorough HGMP would be completed once the format was finalized by NOAA Fisheries and the Service. The Idaho FRO completed these more detailed HGMP during the fall of 2002.

These documents, considered “Phase I drafts,” will describe current operations at the hatchery and will comply with ESA obligations, covering both NOAA Fisheries and Service trust species. It is anticipated that the Phase I drafts for all hatcheries, including Dworshak NFH, will be distributed to the co-managers and other interested parties and will serve as the focus for a collaborative, phase II

part of the process. Collaboration meetings should begin in late 2003 and continue through 2004. Drafts for any proposed new projects/programs will be developed by appropriate proponents and also discussed and reconciled during Phase II. This process will produce Phase II draft plans.

For HGMP that involve unreconciled differences, the Phase II options could create "scenarios" that can be presented to the Technical Review Team (TRT) for consideration and advice. The Phase II draft plans will be completed and set aside (parked) until all HGMP relevant to an Evolutionarily Significant Unit (ESU) are completed, allowing for ESU-wide considerations and feedback with the TRT/Recovery Planning processes. The HGMP collaborators will incorporate TRT advice as appropriate to ensure consistency with broader recovery objectives. This step culminates in Phase III drafts, which become final and ready to implement after approval by NOAA Fisheries and the Service.

Of special concern in the lower Clearwater River is the potential for ecological interactions between wild (listed) A-run summer steelhead and the B-run hatchery steelhead released from Dworshak NFH. From 1994–1997, the Idaho FRO conducted research on the interactions of hatchery and wild steelhead in the Clearwater River of Idaho. From 1999–present, the Idaho FRO continued the investigation with Bonneville Power Administration (BPA) funding, focusing primarily on factors related to residualization of steelhead in the Clearwater River.

3.6.8 Environmental Monitoring. Environmental monitoring is conducted at Service facilities to ensure these facilities meet the requirements of the NPDES permit and is also used in managing fish health. Monitoring helps identify when changes in hatchery practices are required. The hatchery operates under NPDES Permit # ID-002151-2

Sixteen discharge points on the hatchery are sampled once per month for flow and the following parameters:

- Total Suspended Solids (TSS) - At the pollution abatement pond inflow and effluent samples.

- Settleable Solids (SS) - At the pollution abatement pond inflow and effluent samples.

- In-hatchery Water Temperatures—maximum and minimum daily.

- In-hatchery Dissolved Oxygen—as required by stream flow or weather conditions.

3.6.9 Coordination/Communication. Dworshak NFH holds production and planning coordination meetings twice annually. Representatives from the Complex, Idaho FHC, IDFG, NPT, COE, and the NMFS attend regularly. Other agencies and organizations send representatives when topics of discussion are pertinent. The meetings focus primarily on upcoming production plans,

reviews of recently completed production activities, interagency production coordination, potential implications of upcoming or ongoing maintenance and construction on production, major fish health issues, and ongoing or planned research.

A new process, the Clearwater Basin Annual Operation Plan (AOP), was developed and implemented in the spring of 2004 by the Idaho FRO. In lieu of the Dworshak Fishery Complex's spring coordination meeting, the AOP provides a more comprehensive approach to fisheries production and management coordination between all the State, Federal, and Tribal fisheries offices in the Clearwater River basin. All aspects of production and management for all species in the basin are included. Coordination meetings are held in the fall to evaluate progress on the AOP during the production year.

While long term planning and coordination is handled at the Complex's spring and fall coordination meetings, the Dworshak HET is responsible intracomplex coordination and communication. The Team is composed of representatives from Idaho FHC, Dworshak NFH, and the Idaho FRO. The HET does not have a regular meeting schedule but meets as issues and activities require. The Team is responsible for coordinating production activities such as spawning, marking and tagging, smolt releases, fish or egg transfers, or adult outplanting. The HET is responsible for identifying production constraints or opportunities to improve rearing and release strategies. Evaluation or research projects are then designed and conducted to provide the data necessary to make recommendations for implementing change. All research or requests to the hatchery from outside agencies or offices are reviewed by the HET with recommendations for approval/disapproval sent to the Complex Manager for final authorization.

3.6.10 Fish and Egg Transfers. Fish and egg transfers are coordinated through Dworshak NFH and the IDFG. Researchers working at Dworshak are requested to obtain any pertinent state permits concerning fish and egg transfers to and from Dworshak. Any outside eggs or fish coming on to Dworshak are subject to disinfection protocol established by IHOT, the Dworshak Production Department and the Idaho FHC.

3.6.11 Ocean Fisheries Management. Dworshak NFH spring chinook salmon and summer steelhead are not recovered in ocean fisheries in significant numbers and do not influence ocean fishery management decisions.

3.6.12 Freshwater Fisheries Management. Harvestable surpluses of summer steelhead and spring chinook salmon originating from Dworshak NFH are managed by the IDFG and NPT. These agencies are responsible for setting regulations for terminal sport and tribal harvests. Fishing regulations are set to provide for adequate escapement for hatchery production and to meet ESA guidelines.

3.7 Public Outreach Activities

Dworshak Fisheries Complex Information and Education (I&E) Office services Dworshak and Kooskia NFH's and the Idaho FRO. The Office shares/distributes its time and staffing between these stations. The I&E program is mainly funded by Dworshak NFH with assistance from Kooskia NFH and the Idaho FRO.

The goal of Dworshak Fisheries Complex outreach program is to increase the visibility of the Fish and Wildlife Service facilities in the Clearwater River Basin, and to provide information about Service programs to internal and external audiences. Staff and volunteers show how Service

programs benefit the public and the environment in keeping with the Service=s mission, *AWorking with others to conserve, protect, and enhance the Nation=s fish and wildlife and their habitats for the continuing benefit of the American people.@*

Recognizing that it is increasingly important for all staff to be involved in gaining or retaining public support for our programs, the I&E program will strive to ensure that staff are well-informed about policies, procedures, and issues; and they are willing and able to interact with our various publics. Program efforts will include providing information to staff, partners, and volunteers; through them, to members of the community and other publics. Outreach will be used as a management tool, providing support to the Service, the public, and our hatchery programs.

3.7.1 On Station. On station activities include an average of 85 guided tours annually to local schools. Some special interest groups schedule more in-depth tours of specific hatchery operations. On site educational efforts include Jr. High Science Day each May introducing Orofino 7th and 8th graders to various elements of the hatchery and general stewardship of the outdoors. Various Natural Resource Conservation Service (NRCS) – county agency Environmental Days are held May – July for 6th grade students over 3 day periods. Students from 4 – 5 area schools raise spring Chinook salmon or steelhead trout in their classrooms and visit the hatchery annually to release their fish and tour the facility. Annual events include an Open House/Kids Fishing Day in June. Additional coverage by I&E staff is provided on weekends during peak visitation (May - September) to give tours, answer questions, staff the Dworshak Spawn Shop, and disseminate general information.

3.7.2 Off station. Outreach efforts include an array of activities that occur throughout the Pacific Region, with an emphasis on Idaho events. Examples include natural resource career fairs, festivals, classroom activities at local schools, stream and water quality surveys, participation in other NFH events, and county fairs (Clearwater, Idaho and Lewis counties).

The hatchery houses a traveling fisheries exhibit complete with photo panels, video player, and steelhead diorama. This exhibit is displayed at several outdoor venues each year. The Service chooses events reaching a broad audience, and rotates staffed offsite events yearly due to minimal staffing levels.

Virtual visitors can tour Dworshak NFH through the World Wide Web at http://dworshak.fws.gov. Web statistics show 524 hits per month average use of the web site. We are negotiating as a beta test site for a web-camera offering 360 degree views of the facility.

3.7.3 Partnerships/Cooperators/Stakeholders. A bulleted list of events and partnerships follows:

- Clearwater, Idaho, Latah and Lewis county public schools – Dworshak/Kooskia NFH provides spring Chinook salmon or steelhead trout eyed eggs for Hatchery-In-The-Classroom activities in February; classes tour the hatchery, conduct ‘Fin Bin’ activities, then release their fish in May.

- Orofino Jr. and Senior High Schools – provide staffed Career Day station annually on fisheries and FWS careers, with hands-on tools and employment information.

- Clearwater Basin Advisory Council – actively participate on this team for regional and local

outdoor or public use projects.

- $ Columbia Basin Environmental Education Capacity Building Initiative (CBI) – I&E staff actively participate on the Lower Snake River Advisory team for this group, meeting throughout the year to identify all environmental/natural resource education in region, correlate with 10 sub-basin groups to develop a region-wide plan for Environmental Education (EE).

- $ Earth Week Educators – Attend and plan event with multi-agency committee Jan – May; annual April presentation over 3 days to 300 area 4th graders, at Big Eddy Rec area, Dworshak Reservoir. Present interactive fisheries lessons, participate in daily group summary activity.

- $ Friends of Northwest Hatcheries - continue to strengthen and expand this partnership; operate the Dworshak Spawn Shop sales area at the hatchery. Dworshak NFH Complex signed an official MOU with the Friends Group and the Regional Director in January, 2002. I&E Coordinator acts as Idaho contact/shop manager for FNWH.

- $ Latah County Environmental Awareness Days – annual participation at 2 day event at Spring Valley Reservoir conducting interactive lessons for 300 6th students.

- $ Nez Perce County Outdoor Education Days – Hells Gate State Park, annual participation at 2 day event for 250+ students, conducting interactive fisheries lessons.

- $ Idaho County Sports Show - May, Grangeville, ID; staff outdoor booth on FWS fishery programs, local NFH, and advertise for June Open House events.

- $ Orofino, Kamiah, Kooskia, Nez Perce schools – I&E staff lead fish dissections to reinforce internal and external anatomy, pre or post-hatchery tour.

- $ Upper Clearwater Arts Council - cooperative effort with various activities and events annually primarily at Kooskia NFH. MOU in place for their use of vacant residence trailer as office/meeting/storage space on hatchery grounds.

- $ U.S. Army Corps of Engineers, Dworshak Dam - cooperative effort with outreach activities including booth at annual Kids' Fishing Day, joint county fair booth, Clearwater County 6th grade Forestry Tour.

- $ U.S. Forest Service - cooperative effort with outreach activities including Kids' Fishing days, day camps and cultural resources events.

- $ Idaho Salmon and Steelhead Days, Boise – on the planning committee for this annual event, Gyotaku activity chairperson for over 3,000 4th grade students.

- $ Salmonfest – host Gyotaku activity at annual Leavenworth NFH event for over 10,000 people in 4 days.

3.7.4 Stakeholders, Partners, Cooperators:

- $ COE, Walla Walla District.
- $ LSRCP.
- $ NPT – Cultural and Natural Resources division.
- $ Couer'd Alene Tribe.
- $ Idaho FHC.
- $ Idaho State Parks – Dworshak, Hells Gate and Winchester State Parks.
- $ National Park Service – Nez Perce National Historic Park, Spalding ID.
- $ US Forest Service – Clearwater National Forest: Orofino, Kamiah and Kooskia districts.
- $ NOAA Fisheries - funding agency via Mitchell Act and ESA trust responsibilities.
- $ Bonneville Power Administration.
- $ Northwest Power Planning Council.
- $ Private land owners in Clearwater River Basin watershed.
- $ Idaho Department of Environmental Quality, and U.S. Environmental Protection Agency - water quality and effluent discharge permits.
- $ U.S. *v* Oregon parties - co-managers of Columbia River fisheries, including Yakama Nation, Confederated Tribes of the Umatilla Indian Reservation, NPT, Confederated Tribes of the Warm Springs Reservation in Oregon, Washington; Department of Fish and Wildlife, Oregon Department of Fish and Wildlife, IDFG, NOAA Fisheries, U.S. Fish and Wildlife Service.
- $ Idaho Water Resources Research Institute.
- $ Clearwater, Idaho, Lewis, Latah, Nez Perce county public school districts
- $ Lewis-Clark State College, University of Idaho and Washington State University campuses.
- $ Clearwater Power, Idaho Power and Chelan County Public Utilities District.
- $ Nez Perce National Historical Trail Administrator's Office.
- $ State and local Lewis and Clark Bicentennial planning committees.
- $ Idaho State Historical Society; Cultural Heritage Foundation, Idaho Community Foundation and Hells Gate Education Association.
- $ Clearwater Tribune, Lewiston Morning Tribune, Clearwater Progress, Idaho Co. Free Press, Lewis Co. Herald, Spokane Spokesman-Review; 4-K Radio Network and KRLC-am.
- $ Clearwater River Youth Program and Idaho State Job Service.

CHAPTER 4 - IMPLEMENTATION

Implementation of the Dworshak NFH program requires input to direct funding budget processes, as well as compliance with Service policies, legal mandates, and other environmental and human resource laws. This chapter outlines these processes and discusses the policy and planning documents which provide guidance to Dworshak NFH in regards to policy, budget, safety, grounds and facilities maintenance.

4.1 Budget Overview

Dworshak NFH receives 100% of its operations budget for the summer steelhead program directly from the COE. Annual operation and maintenance budgets are developed 2 years in advance and are negotiated with the COE to determine the final fiscal year allocation. Additional COE funding

is provided through the Dworshak NFH budget to the Idaho FRO and the Idaho FHC for support services to the hatchery.

The spring Chinook salmon program receives 100% of its funding through the LSRCP program which in turn is directly funded by the BPA. Annual budgets are submitted by the hatchery to the LSRCP. Additional LSRCP funding is provided to the Idaho FRO and the Idaho FHC for support services to the hatchery.

4.1.1 Budgetary Needs and Strategies. The "Goals and Responsibilities – Program Document", is the primary document used by the Dworshak NFH for identifying budgetary needs for annual production costs, annual facilities maintenance, new construction, program modifications, and other costs associated with the maintenance and operations of the hatchery. This document is updated annually and is used for negotiating annual budgets with both the COE and LSRCP. In 1990, the COE also developed a Rehabilitation Plan for Dworshak NFH that identifies areas where modifications or updates of facilities and equipment are necessary. This document is also used to prioritize and schedule budgeting for the hatchery.

4.1.2 Fisheries Operational Needs System (FONS). The FONS was established in 1999 as a planning, budgeting, and communication tool to enhance identification of funding and staffing needs for the fishery program. FONS projects are used in budget requests to the Department of Interior and the Office of Management and Budget. **Attachment 18** outlines the Regional and National budget formulation, and provides a time step through the process. Dworshak NFH uses the FONS system to report accomplishments and identify certain I&E projects, but does not use FONS to identify hatchery projects or operations that need funding.

4.1.3 Maintenance Management System (MMS). The MMS is an inventory of deferred maintenance projects, which are maintenance projects that can be put off or do not occur on an annual basis. Dworshak NFH does not use this system but relies on the COE Rehabilitation Plan or LSRCP in combination with the Goals and Responsibilities Program Document.

4.1.4 ESA Compliance and Needs. The 1999 NOAA Fisheries Biological Opinion on Artificial Propagation in the Columbia River Basin lists several measures for Dworshak NFH which either must, in the case of Reasonable and Prudent Alternatives, be complied with, or in the case of Conservation Recommendations, should be implemented (NMFS 1999b). However, during development of the Phase II drafts of the HGMP, there may be actions identified at that time that may not be funded by either the COE or LSRCP where another source of funding may have to be sought.

4.2 Service and Station Guidance

Each Service hatchery operates under a variety of guidance and policies. This section is provided to describe some of the more important policy and guidance documents that are available at the hatchery.

4.2.1 Quarters Policy. The Service administers a variety of field offices and NFH's. At many of these hatcheries, including Dworshak NFH, government owned residences are available to employees on a required occupancy basis. The determination of whether an employee must occupy government furnished quarters as a condition of employment is made on a station-by-station, position-by-position basis. In making a determination, supervisors consider the dependability of the water supply, adequacy of the alarm and call back systems, response time needed to take emergency corrective actions, and the adequacy of the security provided to protect fish, facilities, and equipment. **Attachment 19** is a copy of the current quarters policy.

4.2.2 Required On-Station Housing. The current policy for Occupancy of Government Quarters at Dworshak NFH is covered by a June 26, 1997 memorandum (**Attachment 20**). The intent of having personnel living in government quarters at Dworshak NFH is to provide station security and operations during non-duty hours. Mechanical systems to regulate water flows must be maintained immediately to prevent loss of valuable fish stocks. Additional security protection of government owned property is provided by occupants especially when anadromous brood stock are present.

4.2.3 Overtime/Compensatory Time/Call Back. Regulations governing overtime, compensatory time, and call back are described in the U. S. Fish and Wildlife Service Administrative Manual. Premium pay is discussed in Part 225 FW of the Manual with specific discussions on overtime regulations in Chapter 7.8, callback overtime in Chapter 7.13, Compensatory time in Chapter 7.18, and standby in Chapter 7.22.

4.2.4 Distribution of Surplus Fish/Eggs. Guidance was provide in a July, 2001, memorandum from the Regional Director (**Attachment 21**). The guidance states:

"Live fish entering a National Fish Hatchery (Hatchery), whole fish carcasses or their parts, are Government property and cannot be converted for personal use, even temporarily on loan. Misuse of Government property may result in disciplinary action ranging from a written reprimand to removal from the Service. The attached Standards of Ethical Conduct for Employees of the Executive Branch, contained in 5 CFR 2635.704, specifically address use of Government property. Please review and be acquainted with these standards. Also, please ensure that all your employees read and understand this memorandum.

It is important that you first consider all possible uses of hatchery fish that are consistent with the Service Mission. Surplus fish must be disposed of using prescribed government contracting procedures. Furthermore, you must comply with other Service and FDA policies related to the disposition of carcasses and parts that have been treated with chemicals making them unfit for human consumption."

4.2.5 Drugs and Anesthetics. Guidance on the use of anesthetics, drugs and other chemicals was provided in a November 9, 2000 memorandum from the Assistant Regional Director for Fisheries in Region 1 (**Attachment 22**). Hatcheries and other Fisheries offices within Region 1 may at times have legitimate and necessary reasons to use certain drugs and chemicals to achieve their goals and complete the mission and objectives of the Service. During the capture, rearing, or monitoring of fish species, several drugs and chemicals are used for anesthesia, disease treatments, or to increase

the survival of the animals. Some of these compounds are already registered and labeled for fisheries use. Others may be legally used under the prescription and supervision of a veterinarian, or within the protocols of an existing INAD exemption permit issued by the Food and Drug Administration (FDA). The Service has existing correspondence from the FDA concerning the use of compounds in the recovery of threatened and endangered species, but there are strict considerations and limits even in those situations. Region 1, working closely with the National INAD Office and through appropriate consultation with FDA, will fully comply with all regulations and agreements for the use of aquatic drugs and chemicals. The inappropriate use of compounds on fish or aquatic animals intended for human or animal consumption is prohibited.

4.2.6 Employee Training. Regulations governing employee training are described in the U. S. Fish and Wildlife Service Administrative Manual. Career development is discussed starting in Part 230 FW of the Manual.

4.3 Service Required Planning Documents

Daily operations of Dworshak NFH are guided by a number of plans and reports designed to promote health and safety, station development, emergency situations, employee training, and other actions. Some of the more significant ones are described in the following section:

4.3.1 Safety and Health Plan. Regulations for safety are described in the U. S. Fish and Wildlife Service Administrative Manual. Safety program discussions start in Part 240 FW of the Manual. Dworshak Fisheries Complex has a safety officer and a safety committee with representatives from each project office. Copies of the Safety and Health Plan are located in each project office with the Master Plan located in the Safety Officers office. The Safety and Health Plan covers: Lock Out/Tag Out, Spill Prevention, Hazardous Wastes, Blood Borne Pathogens, Hearing Protection, Confined Space, Personal Protection Equipment, Emergency Response, Ergonomics, Work Place Safety, and Material Handling.

4.3.2 Fire Management Plan. Department and Service policy require that “every area with burnable vegetation must have an approved Fire Management Plan” and field stations cannot conduct prescribed fire operations, including trash burning, without an approved Fire Management Plan that includes such activities. All Service facilities developed plans and had them approved in FY2001, but they must be amended before any controlled burning can be conducted. The Fire Management Plan for Dworshak NFH is located in the administration office.

4.3.3 Integrated Pesticide Management Plan. It is Service policy to eliminate unnecessary use of pesticides by implementing integrated pest management techniques and by selecting crops and other

vegetation that are beneficial to fish and wildlife but do not require pesticides. The ultimate goal is to eliminate pesticide use on Service lands and facilities and to encourage pest management programs that benefit trust resources and provide long-term, environmentally sound solutions to pest management problems on sites which are off Service lands (**Attachment 23**).

Pesticides are not used on the facility. If and when herbicides have to be used, the operation is

contracted out with personnel at Dworshak Dam.

4.3.4 Station Development Plan. Station Development Plans were completed for many stations in the early to mid-80s. Most are in need of revision and 1 to 3 stations will be updated each year as funds and personnel availability allow. Dworshak NFH does not currently have a Station Development Plan. A plan needs to be written to include new and much needed station improvements. Currently, station needs for planning are handled through the Goals and Responsibilities – Program Document and the COE's Rehabilitation Plan. An Operation Plan was completed in 2003.

4.3.5 Monitoring and Evaluation Plan. Monitoring and evaluation of production programs are outlined in HGMP which can be found at the hatchery, the Idaho Fisheries Resource Office, or through the Fishery Program Office in Portland. A more detailed discussion of this plan can be found in Chapter 3.

4.3.6 Distribution of Surplus Fish. In this exercise the hatchery works cooperatively with the Idaho FRO and co-managers IDFG and the NPT to plan beneficial uses of fish surplus to hatchery needs in years of large adult returns. Planning considers all possible uses of adult carcasses and live fish in excess of hatchery needs, and is coordinated with co-managers to achieve mutually satisfying solutions. After being spawned, adult summer steelhead carcasses that are in good shape are distributed either to the Nez Perce and Coeur 'd'Alene tribes for distribution tribal families for food, or to the local food bank. Caracasses that are not fit for human consumption, are given to the University of Idaho or Washington State University to feed wildlife such as eagles, bears, etc. when those programs have the need. Otherwise, carcasses are disposed of at the local refuse transfer station. In recent years, plans have been discussed whereby carcasses would be used for stream fertilization. Carcasses of adult spring Chinook salmon are disposed of at the local refuse transfer station because the chemical anesthetic used during spawning makes the fish unfit for human consumption.

4.3.7 Small Water Systems Management Plan (Drinking Water). The Safe Drinking Water Act (SDWA) delegates safe drinking water control to the states and we must meet state requirements to provide drinking water to the public as well as our employees and their families. The EPA recently indicated that they believe that a significant number of the Service's systems do not fully comply with the SDWA. They have requested that we audit our compliance with state regulation. Currently, Dworshak NFH is not in compliance with the state of Idaho because it uses surface water to supply drinking water needs. Dworshak NFH is currently working with the COE and the Department of Environmental Quality on a new water treatment facility. The preliminary design is complete and we are waiting on the results of a community water system.

4.3.8 Continuity of Operation Plan. The continuity of Operations Plan provides guidance for Dworshak NFH staff to ensure that essential operations and activities continue during and after an emergency situation. The plan is developed in accordance with DOI, MRPS Bulletin 98-01, Continuity of Operations Planning - Guidance and Schedules, dated March 27, 1998, and 380 DM 6, Vital Records Program. This plan is current and located at the hatchery in the administrative files.

4.3.9 Spill Prevention, Control and Counter Measure Plan. A Spill Prevention, Control, and Countermeasure Plan (SPCC) is prepared in accordance with the provisions of Title 40 of the Code of Federal Regulations, Part 112. An SPCC plan establishes procedures, methods, and equipment used at the Carson hatchery to comply with U. S. Environmental Protection Agency (EPA) oil spill prevention control and countermeasures standards, and inspection reporting, training and record keeping requirements. An SPCC is required at Dworshak NFH because it stores petroleum fuel in above ground storage tanks greater than 660 gallons. The SPCC for Dworshak NFH is current (April 1999) and can be located in the hatchery administrative files, or the Fisheries Program Regional Office in Portland.

4.3.10 Outreach Plan. An outreach plan (see Chapter 3) describes the hatchery's strategy for telling the Service, Dworshak National Fish Hatchery, and the Columbia River Basin resource story to the public. Further, this plan describes outreach tools and facilities needed to implement this strategy. The plan should be cited when describing unmet outreach needs in the FONS database (see Fish and Wildlife Service Budgeting Process).

4.3.11 Watershed/Sub-basin Plan. These documents are part of the Northwest Power Planning Council process to address fisheries and aquatic issues related to subbasin and recovery planning in the Columbia River basin and in facilitating implementation of recovery actions.

National attention has been focused on the Columbia River Basin with listings of salmon and steelhead, bull trout and other aquatic species. ESA consultations and recovery planning for listed species are having a major impact on management of fishery resources, the economy and cultural values in the basin. Consultations include the operation of the Federal Columbia River Power System, hatchery operations, harvest actions, habitat planning and project specific activities. Planning processes include the development of an All H Paper which is a conceptual recovery plan for salmon, steelhead and other aquatic species in the Columbia River basin, and various state and local government recovery planning efforts in Washington, Oregon, Idaho and Montana. The Pacific Northwest Electric Power Planning and Conservation Act resulted in the establishment of the Northwest Power Planning Council and ultimately the development of its Columbia Basin Fish and Wildlife Program, a comprehensive program to enhance and restore the salmon and steelhead runs and other fish and wildlife resources of the Columbia River Basin. The Northwest Power Planning Council is leading a major subbasin assessment and planning effort that will provide key building blocks for aquatic species restoration in the basin. At the same time the Service has initiated recovery planning for bull trout and NOAA Fisheries for salmon and steelhead.

Each of these recovery plans will rely on subbasin planning as major building blocks for recovery of listed species. In addition, Implementation Plans have been developed by the COE, Bonneville power Administration, and the Bureau of Reclamation that require implementation of significant habitat actions for listed salmon.

There are over 30 different agencies, Indian tribes, councils or commissions with fisheries responsibilities or interests operating in the Columbia River Basin. The effective management and

restoration of Columbia River Basin salmon and steelhead and other aquatic resources depends to a large extent on the ability of these agencies to communicate effectively, resolve differences, develop unified subbasin plans, and work together in a spirit of cooperation in various interagency forums to solve regional and river basin problems.

4.3.12 National Pollution Discharge Elimination System. Dworshak NFH is currently in compliance with required NPDES permit requirements for discharge from the hatchery (NPDES Permit # ID 00021512).

4.3.13 Hazardous Waste. Dworshak NFH is currently, to the best of our knowledge, in compliance with all hazardous waste treatment and control regulations. Efforts have been made to reduce dependence on products resulting in hazardous waste to the greatest extent possible. EPA identification number is ID 4143619951.

4.3.14 Investigative New Animal Drugs (INAD). Drugs requiring an INAD use permit have been used in recent years. These include #9013 – Formalin, #10-541-Aqui-S, #8061 – LHRHa, #9332 – Oxytetracycline, #10-697 – Florfenicol, and #4333 – erythromycin. Prophylactic treatments with erythromycin to combat BKD have been discontinued pending demonstrated need such as a BKD epizootic. Should erythromycin treatment become necessary, all INAD procedures will be followed.

4.4 Monitoring and Reporting

There are a number of activities at the Dworshak NFH that require monitoring and periodic reporting. Although not mandatory, several other reports and summaries are prepared as well. A list is provided below.

4.4.1 Monthly Activity Reports / Production Narratives. On a monthly basis, all the pertinent production, maintenance, and administrative activities are summarized. The production narratives are especially useful by providing regular updates on the progress of summer steelhead, spring chinook salmon and rainbow trout production on the hatchery. All significant changes in operations, fish health, or management are reported. The station annual report, broodyear reports, and other documents rely directly on these summaries.

4.4.2 Monthly Inventory Statements. The statements are produced monthly by the production crew and summarize the numbers of fish on hand in every rearing container, the number of mortalities, the amount of growth, amount of feed fed, and other details of production.

4.4.3 PIT Tag Information System (PTAGIS). One of the requirements of using PIT tags for monitoring fish is that the participating organization has to submit its PIT-tagging operations to PTAGIS by submitting PIT-tag files to the regional PIT-tag database.

4.4.4 Fisheries Information System (FIS). The FIS is a multifaceted database system consisting of five modules which address unmet management needs (out-year budgeting), accomplishments, deferred maintenance, and other national reporting requirements. The following paragraphs provide a more detailed description of the modules and their reporting requirements.

4.4.5 Fisheries Operational Needs System (FONS). FONS was described earlier in this Chapter under “Fish and Wildlife Service Budgeting Process”. This database is available through the hatchery or the Fisheries Program Regional Office in Portland.

4.4.6 Accomplishment Module. The Fisheries Accomplishment Module was established as a planning, budgeting, and communication tool to enhance identification of Fisheries Program accomplishments. These data are used in budget documents presented to the Department, Office Management and Budget (OMB), and Congress. The data structure is a "flip-side" of the FONS Module data structure (see previous Fish and Wildlife Service Budgeting Process). This module is used to describe all accomplishments, regardless of funding source. This database is available through the hatchery or the Fisheries Program Regional Office in Portland.

4.4.7 Fish and Egg Distribution. This information is used in the Fish and Egg Distribution Report. The report describes the mission of the National Fish Hatchery System, a component of the Fisheries Program of the Fish and Wildlife Service, and it’s varied accomplishments. The report contains detailed information regarding species, numbers, and pounds of fish produced. It also describes the general purpose of the production program and if it involves listed species. Copies of the report can be obtained by writing the Division of Fish Hatcheries, U. S. Fish and Wildlife Service, 4401 N. Fairfax Drive, Room 810, Arlington, Virginia 22203.

4.4.8 Imperiled Species Module. The Imperiled Species Module was designed to capture and report on imperiled species work performed by any Fisheries office. For the purpose of this database an imperiled species is any species or population that is 1) Federally listed under the ESA as threatened or endangered, 2) petition, proposed, or a candidate for Federal listing, or 3) a State-listed or species of special concern. Reporting occurs annually, generally in November.

4.4.9 Station Guides. The Station Guide provides an overview of the hatchery program and layout. It describes the station location, layout plan, easements or permits in place, water supply, quarters, office and other buildings. The Guide also provides a brief history of the hatchery. This summary document is useful for providing a quick snap-shot to Service employees and parties interested in the hatchery program and facility layout. The Guide is kept current and generally updated annually. Copies can be obtained from the hatchery or the Fisheries Program Regional Office in Portland.

4.4.10 Real Property Inventory. The Real Property Inventory (RPI) provides an annual update on Service real property (anything fixed to the ground or a building). The RPI was maintained by the

Realty Branch until automated in the Spring of 1999. The update function was “pen-and ink changes to a paper file”. This was changed to an automated system using FileMaker Pro software in FY1999. It was converted to a web-based data base in FY2001. This method of updating the database is expected to continue until FY2003 or FY2004 when it will probably be converted to Maximo/SAMMS, also a web-based database.

4.4.11 Columbia River information System (CRiS) Reports. This database is used at Columbia

River Basin hatcheries to record information related to hatchery operations, marking and tagging, juvenile releases, adult returns, etc. The CRiS also is useful in providing summary reports of this data

4.4.12 Energy Use Report. This is an annual report that summarizes gasoline used at the hatchery. Annual use of electricity and cooling energy is not reported because those expenses are paid for by the COE.

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Attachments

Attachment 1.—Historical Background of National Fish Hatcheries in Region 1.

Station	Year Established	Final Year	Disposition
McCloud River, CA	1872	1882	Closed
Crooks Creek,CA	1879	1887	Moved to McCloud River, CA
Baird (formerly McCloud River), CA	1888	1937	Transferred to Bureau Of Reclamation
Clackamas, OR	1888	1943	Transferred to State of Oregon
Fort Gaston, CA	1889	1898	Replaced by Willamette Falls, OR
Korbel, CA	1893	1896	Closed
Redwood Lake, CA	1893	1898	Closed
Sandy River, OR	1895	1925	Closed
Battle Creek, CA	1896	1946	Closed
Olema (Bear Valley), CA	1897	1898	Closed
Salmon River, OR	1897	1900	Transferred to State of Oregon
Upper Clackamas, OR	1897	1931	Transferred to State of Oregon
Roque River, OR	1897	1932	Closed
Mill Creek, CA	1898	1948	Transferred to FWS Division of Research
Little White Salmon, WA	1898	----------	Operating
Willamette Falls, OR	1899	1942	Closed
Baker Lake, WA	1899	1942	Transferred to US Forest Service
Spring Creek, WA	1901	----------	Operating
Grants Pass, OR	1904	1906	Moved to Applegate Creek, OR
Phinney Creek, WA	1907	1918	Closed
Applegate, OR	1907	1959	Transferred to FWS Division of Research
Cazadero, OR	1908	1913	Closed
Illabot Creek, WA	1909	1927	Closed
Duckabush, WA	1911	1943	Transferred to US Forest Service
Quilcene, WA	1911	----------	Operating
Darrington, WA	1912	1919	Closed
Brinnon, WA	1913	1923	Closed - egg collection
Sultan, WA	1913	1933	Closed
Birdsview, WA	1913	1947	Transferred to State of Washington
Day Creek, WA	1914	1919	Closed
Quinault (Old), WA	1914	1947	Transferred to US Forest Service
St. Helens, OR	1917	1919	Closed
Paris, ID	1918	1921	Closed
Washougal River, WA	1919	1923	Closed
Salmon, ID	1921	1946	Transferred to Bureau of Land Management
Phalon, WA	1922	*	Authorized, but never operated
Snake River, OR	1924	1925	Moved to Salmon, ID
Ozette, WA	1926	1927	Closed

Wind River, WA	1926	1936	Transferred to State of Washington
Mt. Rainer, WA	1931	1942	Transferred to National Park Service
Hagerman, ID	1931	---------	Operating
Butte Falls, OR	1932	1943	Transferred ½ to State of Oregon; ½ to Bureau of Reclamation
Deschutes, OR	1932	*	Authorized, but never operated.
Spokane, WA	1935	1942	Transferred to State of Washington
Yakima Fish Screen, WA	1935	1986	Closed
Delph Creek (Estacada), OR	1936	1954	Transferred to State of Oregon
Carson, WA	1937	----------	Operating
Leavenworth, WA	1938	----------	Operating
Clark Fork, ID	1939	1942	Transferred to State of Idaho
Sun Valley, ID	1940	1941	Closed
Warm River, ID	1940	1951	Transferred to State of Idaho
Entiat, WA	1940	----------	Operating
Winthrop, WA	1940	----------	Operating
Coleman, CA	1942	----------	Operating
Willard, WA	1951	----------	Operating
Eagle Creek, OR	1953	----------	Operating
Abernathy, WA	1957	----------	Operating
Lahontan, NV	1964	----------	Operating
Tehama-Colusa Spawning Channels, CA	1967	1989	Caretaker status
Quinault, WA	1969	----------	Operating
Dworshak, ID	1969	----------	Operating
Kooskia, ID	1970	----------	Operating
Marble Bluff Fishway, NV	1974	----------	Operating
Warm Springs, OR	1974	----------	Operating
Makah, WA	1981	----------	Operating
Nisqually, WA	1991	----------	Operating
Livingston Stone, CA	1992	----------	Operating

Attachment 2.—Statutory Mandates and Authorities**.**

General Authorizations

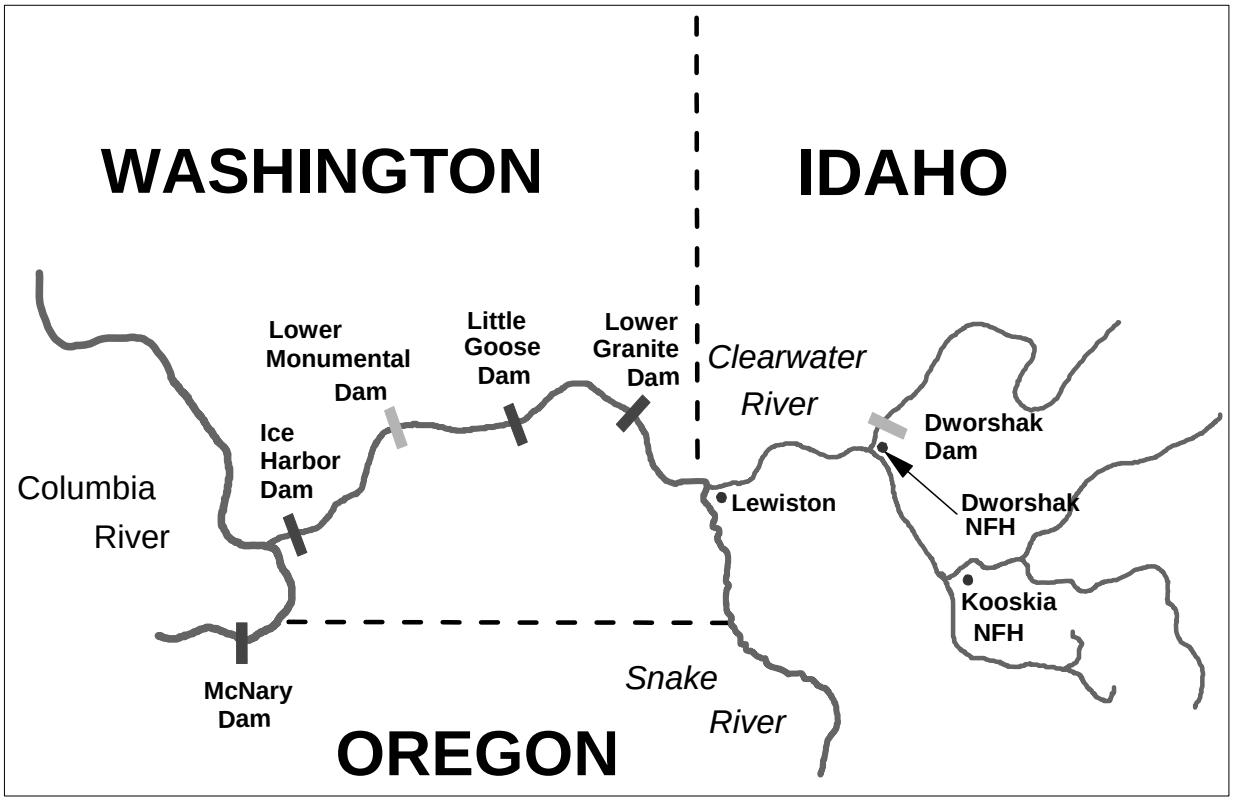
- Anadromous Fish Conservation Act, as amended (16 U.S.C. 757a-757f).
- Department of Transportation Act (16 U.S.C. 1653f).
- Estuary Protection Act (16 U.S.C. 1221-1226).
- Federal Aid in Sport Fish Restoration Act of August 9, 1950, as amended (16 U.S.C. 777k).
- Federal Water Pollution Control Act Amendments, as amended (33 U.S.C. 1251-1365, 1281-1292, 1311-1328, 1341-1345, 1361-1376).
- Fish and Wildlife Act of 1956, as amended (16 U.S.C. 742a-742j).
- Fish and Wildlife Conservation Act of 1980 (16 U.S.C. 2901-2911).
- Indian Self-Determination and Education Assistance Act of 1976 (25 U.S.C. 450-450n).
- Magnuson Fishery Conservation and Management Act of 1976 (16 U.S.C. 1801-1882).
- National Aquaculture Act of 1980, as amended (16 U.S.C. 2801-2810).
- Reorganization Plan No. 4 of 1970 (5 U.S.C. Appendix).
- Rivers and Harbors Act of 1899, as amended (33 U.S.C. 401 et seq.).
- Recreation Use of Conservation Areas Act (16 U.S.C. 460k-460k-4).
- Sikes Act, as amended (16 U.S.C. 670a-670o).
- Watershed Protection and Flood Prevention Act, as amended (16 U.S.C. 1001-1009).
- Code of Federal Regulation, Wildlife and Fisheries, Title 50, Parts 1 to 199.
- Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 stat. 884) as amended.
- Federal Power Act (16 U.S.C. 791-828c; Chapter 285, June 10, 1920; 41 Stat. 1063) as amended.
- Federal Water Project Recreation Act (16 U.S.C. 460 (L) (12) - 460 (L) (21); P.L. 89-72.
- Fish and Wildlife Coordination Act (16 U.S.C. 661-667e; 48 Stat. 401) as amended.
- Fish and Wildlife Improvement Act (16 U.S.C. 7421; 92 Stat. 3110)
- Lacy Act Amendments of 1981 (P.L. 97-79; 95 Stat. 1073, 16 U.S.C. 3371-3378)
- Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 [Title I of P.L. 101-646 (104 Stat. 4761].
- Oil Pollution Act of 1990 [Public Law 101-380 33 U.S.C. 2701 et seq; 104 Stat. 484].
- Comprehensive Environmental Response Compensation and Liability Act (Superfund) (26 U.S.C. 4611-4682; P.L. 96-510, December 11, 1980; 94 Stat. 2797).
- National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, January1, 1970, 83 Stat. 852) as amended by P.L. 94-52.
- National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee) as amended.
- Emergency Relief Appropriations Act (49 Stat. 115).
- Reclamation Laws (54 Stat. 1198, 1199).
- Flood Control Act of 1962 (76 Stat. 1193).
- White Act (46 Stat. 371).
- Flood Control Act of 1944, as amended 1950 (58 Stat. 887).

Area-Specific Authorizations

- U. S. v. Oregon, “Belloni Decision” [302 F. Supp. 899 (1969); affirmed, 529 F. 2d 570 (1976)].
- U. S. v. Washington, “Boldt Decision” [384 F. Supp. 312 (1974); affirmed, 520 F. 2d 676 (1975); cert. denied, 423 U.S. 1086 (1976)].
- Water Resources Development Act of 1976 [Lower Snake River Compensation Plan (90 Stat. 2921)].

- Pacific Salmon Treaty Act of 1985, “U.S./Canada Pacific Salmon Treaty” (P.L. 99-5, 16 U.S.C. 3631, 03/15/1985).
- Salmon and Steelhead Conservation and Enhancement Act (16 U.S.C. 3301-3325).
- Pacific Northwest Electric Power Planning and Conservation (16 U.S.C. 839, P.L. 96-501, 94 Stat. 2697) as amended.

Attachment 3. Regional map showing the location of Dworshak NFH in relation to major features of the lower Snake River in Idaho, Oregon, and Washington.



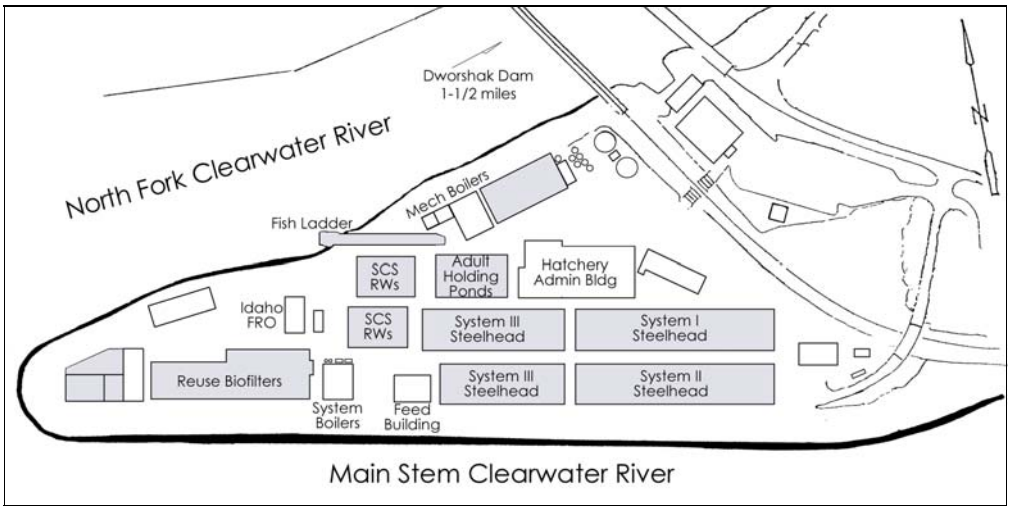
Attachment 4. Hatchery buildings, primary use, type of construction, and improvements.

Building	Construction Type
Main PumpHouse 3204 ft^2	89 ft. x36 ft. Concrete Building constructed in 1968. Contains 6 main pumps, standby generator, 3 traveling water screens and coarse trash rack.
Aeration Chamber 10329 ft^2	114 ft. x 91 ft. Concrete structure built in 1968. Aerates and degases river water.
F&M Pump House 345 ft^2	15 ft. x 23 ft. Concrete Building constructed in 1968 contains 3 pumps.
Visitors Restroom 704 ft^2	32 ft. x 22 ft. Concrete building used for restrooms for the visitors.
Residence # 1 3591 ft^2	Residences at Dworshak NFH consist of 4 wood frame houses constructed in 1969. Houses are 3 bedroom with unfinished basements.
Residence # 2 3591 ft^2	
Residence # 3 3591 ft^2	
Residence #4 3591 ft^2	
Flammable Storage 800 ft^2	32 ft. x 25 ft. Concrete Building constructed in 1968.
Shop 4361 ft^2	49 ft. x 89 ft. Concrete Building constructed in 1968.
System I Pump house 504 ft^2	21 ft. x 24 ft. Concrete Building constructed in 1968.
System I Digester Area 304 ft^2	16 ft. x 19 ft. Concrete Building constructed in 1968.
Mechanical Building I 6624 ft^2	69 ft. x 96 ft. Concrete Building constructed in 1968.
Mechanical Building I add on 768 ft^2	96 ft. x 8 ft. Concrete Building
Cart Shed 520 ft^2	40 ft. x 13 ft. Concrete metal building constructed in 1968
Generator Building 729 ft^2	27 ft. x 27 ft. Concrete Building constructed in 1968.
Mechanical Building II 5468 ft^2	81 ft. x 685 ft. Concrete Building constructed in 1968.
Fish Food Facility 5508 ft^2	Concrete Building constructed in 1968.
Warehouse West 1720 ft^2	20 ft. x 86 ft. Wood/Metal Building.
Vehicle Storage 3780 ft^2	30 ft. x 126 ft. Metal Building constructed in 1968.
Electric Shop 1200 ft^2	20 ft. x 60 ft. Metal Building constructed in 1968.
Main Hatchery Bldg Upstairs 5472 ft^2	Concrete Building constructed in 1968.
Main Hatchery Bldg Downstairs 9120 ft^2	Concrete Building constructed in 1968.
Nursery Building 19200 ft^2	160 ft. x 120 ft. Concrete Block Building constructed in 1968.
Chemical Buildings II & III 256 ft^2	Wood/Metal Buildings constructed in 1968.
Chemical Storage Buildings 73 ft^2	Two Metal Buildings purchased for storing formalin.

Attachment 5. Description of Dworshak NFH rearing units.

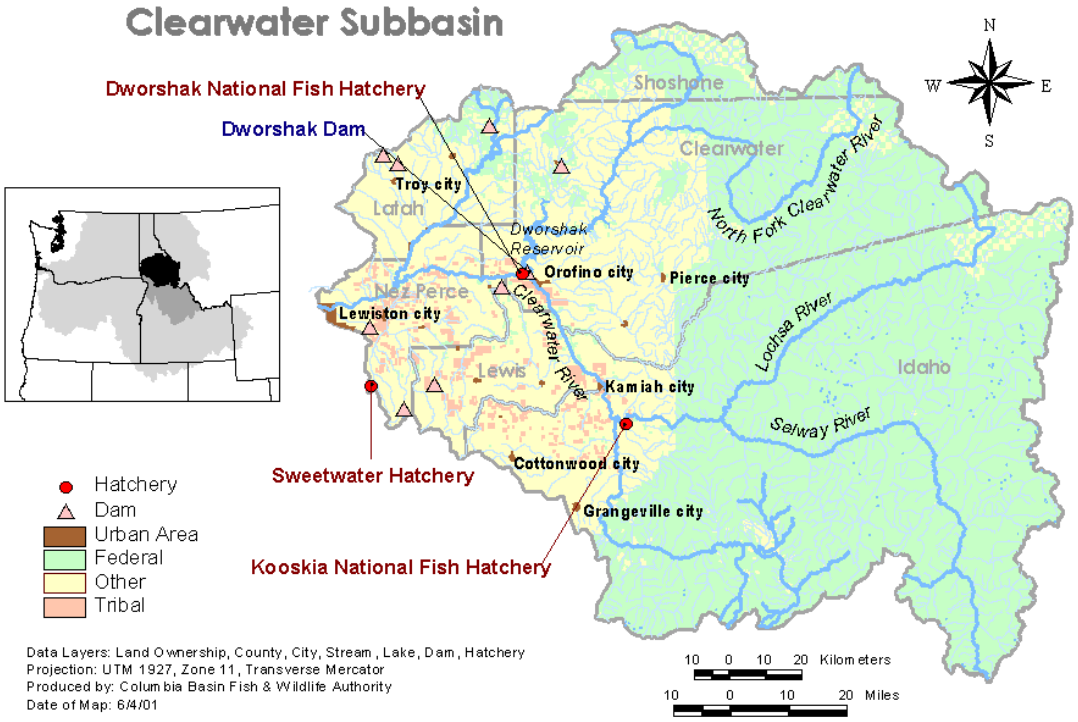
Unit	Length ft	Width ft	Depth ft	Volume ft^3	Volume Gallons	Number	Material	Year Installed/ Constructed
Adult Holding Pond	75	15	7.5	8,438	63,117	4	Concrete	1970
Burrows Pond	75	16.5	2.4	2,933	21,939	84	Concrete	1970
Circular Tank	-	6' Dia	2.5	71	528	4	Fiberglass	2000
Heath Incubator Stacks-16Tray	-	-	-	0.35/tray	2.63/tray	58	Fiberglass	1992-2002
Nursery Tank	16	3	1.9	91	682	64	Concrete	1970
Nursery Tank	16	3	1.8	86	646	64	Fiberglass	1979
Raceway	80	8	2.0	1,280	9,575	30	Concrete	1982
Raceway	63	8	2.0	1,008	7,540	10	Concrete	1978

Attachment 6. Physical layout of Dworshak NFH.



Attachment 7. Aerial photo of Dworshak NFH and Dworshak Dam.

Attachment 8 – Map of the Clearwater River Subbasin and the location of Dworshak National Fish Hatchery.



Attachment 9. Fish species inhabiting the Clearwater River basin.

Common Name	Scientific Name	Origin
Arctic grayling	Thymallus arcticus	Nonnative
Black bullhead	*Ictalurus melas*	Nonnative
Black crappie	*Pomoxus nigromaculatus*	Nonnative
Bluegill	*Leopomis macrochirus*	Nonnative
Bridgelip sucker	*Catostomus columbiansus*	Nonnative
Brook trout	*Salvelinus fontinalis*	Nonnative
Brown bullhead	*Ameiurus nebulosus*	Nonnative
Bull trout	*Salvelinus confluentus*	Native
Carp	*Cyprinus carpio*	Nonnative
Channel catfish	*Ictalurus natalis*	Nonnative
Chinook salmon (fall)	*Oncorhynchus tshawytscha*	Native and Reintroduced
Chinook salmon (spring)	*Oncorhynchus tshawytscha*	Reintroduced
Chiselmouth	*Acrocheilus alutaceus*	Native
Coho salmon	*Oncorhynchus kisutch*	Reintroduced
Golden trout	*Oncorhynchus mykiss aquabonita*	Nonnative
Kokanee salmon	*Oncorhynchus nerka*	Nonnative
Largemouth bass	*Micropterus salmoides*	Nonnative
Largescale sucker	*Catostomus macroheilus*	Native
Longnose dace	*Rhinichthys cataractae*	Native
Mottled sculpin	*Cottus bairdi*	Native
Mountain whitefish	*Prosopium williamsoni*	Native
Northern pike minnow	*Ptychocheilus oregonensis*	Native
Pacific lamprey	*Lampetra tridentata*	Native
Paiute sculpin	*Cottus beldingi*	Native
Peamouth	*Mylocheilus caurinus*	Native
Pumpkinseed	*Lepomis gibbosus*	Nonnative
Redside shiner	*Richardsonius balteatus*	Native
Sandroller	*Percopsis transmontana*	Native
Shorthead sculpin	*Cottus confusus*	Native
Smallmouth bass	*Micropterus dolomieui*	Nonnative
Speckled dace	*Rhinichthys osculus*	Native
Steelhead/rainbow/redband trout	*Oncorhynchus mykiss*	Native and Nonnative
Tiger muskie	*Esox masquinongy x. E. lucius*	Nonnative
Torrent sculpin	*Cottus rhotheus*	Native
Westslope cutthroat trout	*Oncorhynchus clarki lewisi*	Native
Yellow perch	*Perca flavescens*	Nonnative

Attachment 10. State, Federally Listed, or Candidate Wildlife Species

State, federally listed, or candidate wildlife species within the Clearwater sub-basin

(ICDC 1998, U.S. Fish and Wildlife Service 2000d, Idaho Department of Fish and Game 1991).

Scientific Name	Common Name	State	Forest Service	BLM	Federal
Accipiter gentilis	Northern Goshawk	Species of Concern	Sensitive	Sensitive	N/A
Acipenser transmontanus	White Sturgeon	Species of Concern	N/A	Sensitive	Species of Concern
Aegolius funereus	Boreal Owl	Species of Concern	N/A	Sensitive	N/A
Antrozous pallidus	Pallid Bat	N/A	N/A	N/A	N/A
Bartramia longicauda	Upland Sandpiper	Species of Concern	N/A	Sensitive	N/A
Bufo boreas	Western Toad	Species of Concern	Sensitive	Sensitive	Species of Concern
Canis lupus	Gray Wolf	Endangered	N/A	N/A	Endangered
Chlidonias niger	Black Tern	Species of Concern	N/A	N/A	N/A
Cicindela columbica	Columbia River Tiger Beetle	N/A	N/A	N/A	N/A
Corynorhinus townsendii	Townsend's Big-eared bat	Species of Concern	N/A	N/A	Species of Concern
Coccyzus americanus	Yellow-billed Cuckoo	Species of Concern	N/A	Sensitive	N/A
Coccyzus erythropthalmus	Black-billed Cuckoo	P	N/A	N/A	N/A
Cryptomastix magnidentata	Mission Creek Oregonian	N/A	N/A	Sensitive	N/A
Cypseloides niger	Black Swift	N/A	N/A	Sensitive	N/A
Diadophis punctatus	Ringneck Snake	Species of Concern	N/A	Sensitive	N/A
Elgaria Coerulea	Northern Alligator Lizard	N/A	N/A	N/A	Watch
Euderma maculatum	Spotted Bat	Species of Concern	N/A	Sensitive	N/A
Falco peregrinus anatum	American Peregrine Falcon	Endangered	N/A	N/A	N/A
Fisherola nuttalli	Shortface Lanx	N/A	N/A	N/A	N/A
Fluminicola columbiana	Columbia Pepplesnail	N/A	N/A	Sensitive	Watch

State, federally listed, or candidate wildlife species within the Clearwater sub-basin

(ICDC 1998, U.S. Fish and Wildlife Service 2000d, Idaho Department of Fish and Game 1991).

Scientific Name	Common Name	State	Forest Service	BLM	Federal
Gavia immer	Common Loon	Species of Concern	Sensitive	N/A	N/A
Glaucidium gnoma	Northern Pygmy-owl	Species of Concern	N/A	N/A	N/A
Gulo gulo	Wolverine	Species of Concern	Sensitive	Sensitive	N/A
Haliaeetus leucocephalus	Bald Eagle	Endangered	N/A	N/A	Threatened
Histrionicus histrionicus	Harlequin Duck	Species of Concern	Sensitive	Sensitive	N/A
Lanius ludovicianus	Loggerhead Shrike	Species of Concern	N/A	Sensitive	Species of Concern
Lynx canadensis	Lynx	Species of Concern	N/A	Sensitive	Threatened
Martes pennanti	Fisher	Species of Concern	Sensitive	Sensitive	N/A
Myotis ciliolabrum	Western Small-footed Myotis	N/A	N/A	Sensitive	N/A
Myotis evotis	Long-eared Myotis	N/A	N/A	Sensitive	N/A
Myotis thysanodes	Fringed Myotis	Species of Concern	N/A	Sensitive	N/A
Myotis volans	Long-legged Myotis	N/A	N/A	Sensitive	N/A
Myotis yumanensis	Yuma Myotis	N/A	N/A	Sensitive	N/A
Numenius americanus	Long-billed Curlew	N/A	N/A	Sensitive	Species of Concern
Onchorhynchus mykiss	Steelhead	N/A	N/A	N/A	Threatened
Onchorhynchus tshawytscha	Chinook Salmon	Threatened/Endangered	N/A	N/A	N/A
Oreortyx pictus	Mountain Quail	Species of Concern	Sensitive	Sensitive	Species of Concern
Otus flammeolus	Flammulated Owl	Species of Concern	Sensitive	Sensitive	N/A
Picoides albolarvatus	White-headed Woodpecker	Species of Concern	Sensitive	Sensitive	N/A
Picoides arcticus	Black-backed Woodpecker	Species of Concern	Sensitive	Sensitive	N/A
Picoides tridactylus	Three-toed Woodpecker	Species of Concern	N/A	Sensitive	N/A

State, federally listed, or candidate wildlife species within the Clearwater sub-basin

(ICDC 1998, U.S. Fish and Wildlife Service 2000d, Idaho Department of Fish and Game 1991).

Scientific Name	Common Name	State	Forest Service	BLM	Federal
Pipistrellus hesperus	Western Pipistrelle	Species of Concern	N/A	N/A	Watch
Plethodon idahoensis	Coeur d'Alene Salamander	Species of Concern	Sensitive	Sensitive	N/A
Rana luteiventris	Spotted Frog	Species of Concern	N/A	Sensitive	Candidate
Rana pipiens	Northern Leopard Frog	Species of Concern	Sensitive	Sensitive	Species of Concern
Salvelinus confluentus	Bull Trout	N/A	N/A	N/A	Threatened/Endangered
Sitta pygmaea	Pygmy Nuthatch	Species of Concern	N/A	Sensitive	N/A
Synaptomys borealis	Northern Bog Lemming	Species of Concern	Sensitive	N/A	N/A
Strix nebulosa	Great Gray Owl	Species of Concern	N/A	Sensitive	Watch
Strix varia	Barred Owl	Proposed	N/A	N/A	N/A
Ursus arctos horribilis	Grizzly Bear	Threatened	N/A	N/A	Threatened

Attachment 11. Division of land ownership and approximate size of the major drainages in the Clearwater River Subbasin.*

Entity	Mainstem Clearwater		North Fork Clearwater		South Fork Clearwater		Middle Fork Clearwater		Lochsa River		Selway River		Total Sub-basin		Anadromous Sub-basin Area (a)	
	Area in square miles and percent (%)															
U.S. Forest Service	196	(7.6)	1534	(61.7)	790	(68.1)	110	(51.6)	1121	(94.6)	2026	(99.9)	5777	(59.9)	4243	(59.3)
Bureau of Land Management	33	(1.3)	21	(0.0)	23	(2.0)	2	(0.9)	0	(0.0)	0	(0.0)	79	(0.8)	58	(0.8)
U.S. Army Corps of Engineers	1	(0.0)	47	(1.9)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	48	(0.5)	1	(0.0)
Nez Perce Tribe BIA Trust	140	(5.4)	1	(0.0)	10	(0.9)	3	(1.4)	0	(0.0)	0	(0.0)	154	(1.6)	154	(2.2)
State of Idaho	149	(5.8)	290	(11.7)	8	(0.7)	27	(12.7)	0	(0.0)	1	(0.0)	475	(4.9)	290	(4.0)
Private	2051	(79.8)	595	(23.9)	329	(28.4)	71	(33.3)	64	(5.4)	2	(0.1)	3112	(32.3)	2441	(33.7)
TOTAL	2570	(100.00)	2488	(100.00)	1160	(100.00)	213	(100.00)	1185	(100.00)	2029	(100.00)	9645	(100.00)	7157	(100.00)

* Figures for Bureau of Land Management, U.S. Army Corps of Engineers and Nez Perce Tribe/BIA Trust lands were obtained from respective agencies. Figures for other entities were estimated using 1:100000 scale BLM maps.

(a) Area not accessible to anadromous fish (upstream of Dworshak Dam) not included.
Approximate area downstream of Dworshak Dam is 2 square miles.

Attachment 12. Division of selected land use designations and the approximate areas for each major drainage in the Clearwater river Subbasin.

Present Land Use	Mainstem Clearwater	North Fork Clearwater	South Fork Clearwater	Middle Fork Clearwater	Lochsa River	Selway River	Total Subbasin	Anadromous Subbasin Area (a)
Wilderness (sq. Miles)	0	0	106	0	365	1509	1980 20.5 (b)	1980 27.7 (c)
Undeveloped (sq. Miles)	12	946	33	34	527	410	1962 20.3 (b)	1016 14.2 (c)
Classified Rivers (miles)								
Wild	0	0	0	0	0	57	57	57
Recreational	0	0	0	22	62	34	118	118
Municipalities (numbers)	18	1	7	1	2	0	29	28
Hydroelectric No. (proposed)	1 (1)	1 (6)	0 (4)	0 (0)	0 (0)	0 (0)	2 (11)	2 (5)

(a) Area not accessible to anadromous fish (upstream of Dworshak Dam) not included.
(b) Percent of total Clearwater River subbasin (9645 square miles)
(c) Percent of total Clearwater River subbasin accessible to anadromous fish (7157 square miles)

Attachment 13. Return vs. release numbers for summer steelhead at Dworshak NFH, release years 1980-2000.

Release Year	Smolts Released	Returns				Rack Return %
		I-Salt	II-Salt	III-Salt	Total	
1980	2,666,085	400	6,613	652	7,665	0.2875
1981	1,930,047	124	1,538	1,219	2,881	0.1493
1982	2,108,319	1,094	12,679	403	14,176	0.6724
1983	1,259,110	120	3,359	239	3,718	0.2953
1984	1,208,319	700	8,318	119	9,137	0.7562
1985	1,035,573	431	3,487	317	4,235	0.4090
1986	1,239,541	168	5,296	215	5,679	0.4582
1987	1,206,580	428	9,896	314	10,638	0.8817
1988	1,432,125	487	7,339	250	8,076	0.5639
1989	1,073,900	218	3,132	162	3,512	0.3270
1990	1,466,664	313	7,349	153	7,815	0.6699
1991	1,192,503	389	3,543	76	4,008	0.3361
1992	1,224,101	61	1,270	71	1,331	0.1087
1993	1,217,990	48	4,005[1]	83	4,136	0.3396
1994	1,153,417	384	2,537	38	2,959	0.2565
1995	1,213,577	349	3,308	87	3,744	0.3085
1996	1,377,435	253	4,976	69	5,298	0.3846
1997	1,361,034	356	2,225	96	2,677	0.1967
1998	1,228,944	588	5,745	177[2]	6,510	0.5297
1999	1,249,237	570	6,226[2]			
2000	1,311,447	1,330[2]				

[1]Does not include twenty unmeasured fish.

[2] Intermittent ladder operation due to high number of returns.

Attachment 14. Number of steelhead returning to Dworshak NFH, estimates of hatchery fish harvested, and total hatchery returns to the Clearwater River, Idaho, 1972-2002 (1972-73 to 1983-84 data based on report from Pettit, 1985, IDFG Federal Aid Report, Project F-73-6, January, 1985).

Return[1]	Number Back to Dworshak NFH	Estimated Clearwater Sport Harvest[2]	Estimated North Fork Tribal Harvest[3]	Unharvested Dworshak Hatchery Fish[4]	Total Dworshak Fish Returning to Clearwater River
1972-73	9,938	2,068	-	0	12,006
1973-74	7,910	2,320	-	0	10,230
1974-75	1,698	N.S.[5]	290	0	1,988
1975-76	1,858	N.S.	430	0	2,288
1976-77	3,100	N.S.	410	0	3,510
1977-78	12,272	14,000	(1000)[6]	0	27,272
1978-79	4,939	4,610	(500)	0	10,049
1979-80	2,519	N.S.	1,250	300	4,069
1980-81	1,968	4,510	(1000)	500	7,978
1981-82	3,054	1,665	(1000)	0	5,719
1982-83	7,672	13,967[7]	(1,500)	0	23,139
1983-84	3,284	6,500	(500)	100	11,384
1984-85	14,018	19,410	(1,500)	2,700	37,628
1985-86	4,462	7,240	1,471	1,800	15,002
1986-87	5,286[8]	15,679	4,210	3,000	28,175
1987-88	3,764	8,766	1,478	2,000	16,008
1988-89	6,041	11,332	1,242	3,700	22,315
1989-90	10,630	27,952	1,710	3,650	43,943[9]
1990-91	7,876	12,973	1,211	2,250	24,147
1991-92	3,700	10,416	1,326	1,650	17,092
1992-93	7,900	19,351	1,184	3,368	31,803
1993-94	3,757	14,063	675	1,457	17,096
1994-95	1,394	5,953	730	1,307	9,384
1995-96	4,480	2,139	992	1,315	9,106
1996-97	2,980	4,926	513	779	9,198
1997-98	3,601	7,611	145	479	11,836
1998-99	5,419	8,773	1,007	1,137	16,335

Return[1]	Number Back to Dworshak NFH	Estimated Clearwater Sport Harvest[2]	Estimated North Fork Tribal Harvest[3]	Unharvested Dworshak Hatchery Fish[4]	Total Dworshak Fish Returning to Clearwater River
1999-00	2,882	7,177	1,000	720	11,775
2000-01	6,411[8]	12,181	(1,000)[6]	513	20,105
2001-02	7,733[8]	25,196	(1,000)	774	34,703

[1]Return year is from October through May.
[2]Unless otherwise noted, estimates of sport harvest in the Clearwater River taken from Idaho Department of Fish and Game annual reports.
[3]Unless otherwise noted, estimates of tribal harvest in the Clearwater River were taken from Nez Perce Tribe Department of Fishery Resource Management annual reports.
[4]Based on return percentage back to hatchery to calculate returning II-salts from upstream releases.
[5]N.S., no sport fishing season.
[6]( ) guesstimate on tribal harvest by authors.
[7]Pettit IDFG, Lewiston, Idaho (personal communication) included an additional 2,000 fish in harvest from Snake River for a total of 15,967.
[8]Ladder was closed intermittently due to high number of returns; not a total hatchery return figure.
[9]We believe the sport estimate of 27,953 is about 8,000 too high and the total number of Dworshak steelhead to the Clearwater River was in the range of 32,000 to 35,000.

Attachment 15. Genetic background of Dworshak NFH spring Chinook salmon smolts directly released from the hatchery, 1983-2002. (RR = Rapid River, KK = Kooskia, DW = Dworshak, LE = Leavenworth, LW = Little White Salmon).

Release Year	Genetic Background
1983	75% LW, 12% RR, 13% LE
1984	100% LE
1985	68% LW, 32% LE
1986	100% LE
1987 - 1988	100% RR
1989 - 1994	100% DW
1995	66% DW, 34% KK
1996 - 2000	100% DW
2001	64% DW, 36% RR
2002	100% DW

Attachment 16. Return vs. release numbers for adult spring Chinook salmon returns to Dworshak NFH, 1988-2002. Includes sport and tribal harvest or other estimates for 1990, 1997, 1998, 2000, 2001, and 2002 .

Release Year	Smolts Released[1]	I-Salt (% Return)	II-Salt (% Return)	III-Salt (% Return)	Total (% Return)
1988	1,547,219	156	2,709	72	2,937
		(0.0101%)	(0.1751%)	(0.0047%)	(0.1898%)
1989	1,651,472	10	77	40	127
		(0.0006%)	(0.0047%)	(0.0024%)	(0.0077%)
1990	1,251,247	16	286	359	661
		(0.0013%)	(0.0229%)	(0.0287%)	(0.0528%)
1991	1,094,884	23	452	41	516
		(0.0021%)	(0.0413%)	(0.0037%)	(0.0471%)
1992	959,369	9	30	6	45
		(0.0009%)	(0.0031%)	(0.0007%)	(0.0047%)
1993	467,222	3	36	25	64
		(0.0006%)	(0.0077%)	(0.0054%)	(0.0137%)
1994	1,278,273	83	663	1,110	1,856
		(0.0065%)	(0.0517%)	(0.0868%)	(0.1452%)
1995	1,311,445	275	3,571	952	4,798
		(0.0210%)	(0.2723)	(.0726%)	(0.3659%)
1996	102,903	18	230	52	300
		(0.0175%)	(0.2235%)	(0.0505%)	(0.2915%)
1997	53,078	14	78	344	436
		(0.0264%)	(0.1470%)	(0.6481%)	(0.8214%)
1998	973,400	670	7,443	2,452	10,565
		(0.0688%)	(0.7646%)	(0.2519%)	(1.0854%)
1999	1,044,511	496	10,622	1602	12,720
		(0.0475%)	(1.0169%)	(0.1533%)	(1.2711%)
2000	1,017,873	128	3,855		
		(0.0126%)	(0.3787%)		
2001	333,120	161			
		(0.0483%)			

[1] Releases at hatchery only and does not include off-site releases or fry/fingerling

Attachment 17. Total number of Dworshak and Kooskia NFH spring Chinook salmon returning to the Clearwater River annually from 1987 to 2002.

Year	Dworshak NFH Rack	Kooskia NFH Rack Return	Sport Harvest[1]	Tribal Harvest[1]	Total Return
1987	2,017	687	0	210	2,914
1988	1,972	595	0	312	2,879
1989	1,700	973	0	404	3,077
1990	2,042	1,141	369	644	4,196
1991	165	467	0	0	632
1992	370	312	54	160	896
1993	823	1,180	0	43	2,046
1994	74	232	0	0	306
1995	125	40	0	0	165
1996	963	202	0	24	1,189
1997	3,150	1,657	741	847	6,395
1998	915	408	99	202	1,624
1999	800	157	0	37	994
2000	3,202	1,581	3,908	1,183	9,874
2001	4,018	2,261	14,752	3,144	24,175
2002	2,157	1,037	4,709	1,259	9,162

[1] Total estimated sport harvest of Dworshak and Kooskia NFH origin spring Chinook salmon in the Clearwater River Basin.

Attachment 18.—Regional and National Calender for the Budget Formulation Process.

Regional Formulation Process	
November	Project Leaders complete FONS submissions, emphasizing projects related to ecoregion priorities, and forward to the Regional FONS Coordinator. Submissions are reviewed for completeness and clarity. Projects are then submitted to the relevant supervisors for ranking. ARD, Fisheries incorporate supervisor rankings and input, plus regional and national priorities to develop regional ranking recommendations. Regional Director reviews and approves/modifies regional ranking recommendations.
National Formulation Process	
February	Regional FONS submission to Service's Washington Office.
Mar/Apr	Assistant Director, Fisheries and Habitat Conservation and ARD, Fisheries review regional submissions and identify themes. Themes communicated to ARD, Fisheries, Regional Directors, and Director.
May/June	Regions use themes in the development of regional budget requests. Using FONS, project lists will be developed for each theme to be forwarded in the Regional Request.
June	The Service Budget Committee considers the Regional Requests in setting priorities for the Service's Budget Request to the Department.
June≡Jan	As the Service's Budget Request moves through the approval process (Department of Interior and OMB review), ARD, Fisheries will be consulted to ensure that FONS lists still represent the highest priorities of the regions.
February	Presidents budget submitted to Congress including FONS projects for Fisheries Program increases.

Attachment 19. Quarters Policy.

FISH-11

REGION 1 POLICY ON REQUIRED OCCUPANCY IN GOVERNMENT FURNISHED QUARTERS ON NATIONAL FISH HATCHERIES

INTRODUCTION

In order to carry out its mandated responsibilities, the Fish and Wildlife Service administers a variety of field offices and National Fish Hatcheries. At many of these National Fish Hatcheries, government owned residences are available to employees on a reauired occupancy basis. The determination of whether an employee must occupy Government Furnished Quarters as a condition of employment is made on a station-by-station, position-by-position, and residence-by-residence basis. In making the determination, supervisors will consider:

1. **the dependability of the water supply systems;**
2. **adequacy of the alarm and call back systems;**
3. **response time needed to take emergency corrective actions; and**
4. **the adequacy of the security provided to protect fish, facilities, and equipment (See attached Optimum Protection Standards for National Fish Hatcheries in Region 1).**

AUTHORITY

This policy is promulgated under authority of Public Law 88-459, Section 5 (5 USC 5911); Office of Management and Budget Circular A-18; Department of the Interior Property Management Regulation 114-51.302; Departmental Quarters Handbook, 400 DM; and the Fish and Wildlife Administrative Manual 23 AM 11.3.

PURPOSE

The purpose of this policy is to provide uniform guidance in the identification of required occupancy in government owned residences on National Fish Hatcheries, and to ensure consistency in those requirements throughout the Region. The Region will require occupancy of employees at specified hatcheries only when necessary services cannot be rendered or government property cannot be protected effectively and efficiently through means other than the presence of employees on the station. The policy provides for implementation of other methods of protection and security on hatcheries.

SCOPE

This policy is applicable to all National Fish Hatcheries in Region 1 where government owned residences exist on the effective date of this policy and where such residences are subsequently acquired or constructed.

POLICY

Required Occupancy -

It is the policy of the Region to require occupancy of key employees at specified National Fish Hatcheries where necessary services cannot be rendered or government property cannot be protected effectively and efficiently through means other than the presence of employees residing at the hatchery.
Positions and residences assigned required occupancy status will be justified on the basis that the employee filling the position will be familiar enough with station operations to effectively handle emergencies.

The preferred staffing of required occupancy positions will be Project Leader, Assistant Project Leader, and Maintenance man. However, these positions may vary from hatchery to hatchery based on the availability and capability of individual employees. In any case, the Project Leader will be ultimately responsible for ensuring the adequacy of protection for fish, facilities, and equipment.

Employees who perform work outside their tour of duty are entitled to appropriate compensation. Required occupancy will not be used in a manner which places restriction on the employee's freedom of movement regarding scheduled leave, non-work days, off duty hours, and similar benefits.

IMPLEMENTATION

In implementing and administering this policy, the following will apply:

Proiect Leaders

o Will initiate
a **review and determine the following:**

1. **the dependability of the water supply;**
2. **adequacy of existing alarm and call back systems;**
3. **response time needed to take emergency corrective actions;**
4. **the adequacy of security provided to protect fish, facilities, equipment; and**

and

5. **the availability of local housing for rent/purchase.**

0
Will initiate improvements in alarm systems, security, fencing, water supplies, etc., as soon as funding permits. If existing systems are inadequate to provide the required security and protection, make recommendations to the Associate Manager on the level of required occupancy needed on a station-by-station, position-by-position, and residence-by-residence basis.

o Will identify quarters to be made available for occupancy by other government agencies, or for rental to the general public (upon approval from the appropriate Assistant Secretary).

Associate Manager/Assistant Regional Director. Fisheries and Federal Aid

Will review Project Leader recommendations on required occupancy.

o Will modify or approve Project Leader recommendations.

o Will require Project Leaders to annually review required occupancy status and to initiate actions to improve the adequacy of existing security systems (as funding permits).

Other

o Required occupancy status will be reviewed on an annual basis to address changes in station programs/missions, personnel, and available protection. Where it is determined that occupancy of Government Furnished Quarters is not required, the Project Leader must annually certify in writing to the Associate Manager/Assistant Regional Director, Fisheries and Federal Aid, that necessary services can be rendered and government property can be protected effectively and efficiently through means other than the presence of employees residing at the hatchery. This review and certification will be completed by November 1 of each calendar year.

o Where occupancy is required, it will be made a condition of employment and will be contained in the employee's position description and SF-50. In addition, a Form DI 1872, "Certification of Required Occupancy", will be completed. After concurrence by the Regional Director, the form will be forwarded to the Washington Office for final approval by the Director.

o By December 1 of each calendar year, a listing of those residences and positions which have been reapproved for required occupancy will be provided to the Director.

Any new determinations for required occupancy or deletions from required occupancy will follow the procedures outlined in the "U.S. Fish and Wildlife Policy On Required Occupancy In Government Furnished Quarters".

This policy becomes effective when approved.

APPROVED:

Regional Director
Date:

Attachment

Attachment 20. Required On-Station housing policy.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Dworshak-Kooskia NFH Complex
P.O. Box 18
Ahsahka, Idaho 83520-0018

June 26, 1997

MEMORANDUM

To: Employees of Government Quarters
Dworshak Fisheries Complex

From: Complex Manager
Dworshak Fisheries Complex

Subject: Occupancy of Government Quarters at Dworshak Fisheries Complex

The intent of having personnel in the government quarters at the Complex is for security and operation of the facilities during non-working hours. The best arrangement for the complex is to have a 50/50 split of maintenance and production employees. This would cover the fish production and the mechanical operation for the facilities.

At Dworshak NFH, there are four government quarters. The optimal goal would be two production employees and two maintenance employees occupying these quarters. The production employees would be capable of taking care of the production program in an emergency. The maintenance employees would be capable of responding to and taking care of the operational problems that occur.

At Kooskia NFH, there are two government quarters. The ideal situation would be to have one production employee and one maintenance employee living in these quarters. This 50/50 ration will be very difficult to do at Kooskia because the staff consists of only three employees - an assistant hatchery manager biologist, a fish culturist, and a maintenance person. The assistant hatchery manager overseeing the hatchery should live in one of the quarters while the other tenant should be a U.S. Fish and Wildlife employee knowledgeable of the operation and program at Kooskia NFH.

Preference for renting government quarters will be given to biologists and maintenance personnel capable of handling the responsibility of emergency situations. Senority plus knowledge and maturity to handle emergencies will also be used to determine renters. Employees renting complex quarters will receive training and instructions on how to handle emergencies for both production and operational problems.

The occupancy goal will be to have the above ratio of tenants for government quarters based on the criteria given. If no one meeting the criteria wishes or is required to rent the complex quarters then the complex manager will offer the quarters to other complex employees based on hatchery needs and the experience and qualification of the employee.

William H. Miller

Attachment 21. Surplus fish as Government Property.

IN REPLY REFER TO: AFR

United States Department of the Interior

FISH AND WILDLIFE SERVICE

911 NE. 11th Avenue Portland, Oregon 97232-4181

Memorandum

JL .10 2001

To: **Fishery Project Leaders**

From: **Regional Director, Region 1 Portland, Oregon**

Subject: Surplus Fish as Government Property

The Hatchery system in Region 1 is currently enjoying success with increasing returns of adult fish. This success is due in no small part to the dedication of Service Fisheries employees who have worked tirelessly to ensure the Hatchery system produces quality fish. However, it is important that all Service employees honor the public trust placed in them as stewards of the Nation's resources and administrators of public property.

With this memorandum I want to emphasize that live fish entering a National Fish Hatchery (Hatchery), whole fish carcasses or their parts, are Government property and cannot be converted for personal use, even temporarily on loan. Misuse of Government property may result in disciplinary action ranging from a written reprimand to removal from the Service. The attached Standards of Ethical Conduct for Employees of the Executive Branch, contained in 5 CFR 2635.704, specifically address use of Government property. Please review and be acquainted with these standards. Also, please ensure that all your employees read and understand this memorandum.

It is important that you first consider all possible uses of hatchery fish that are consistent with the Service Mission. Surplus fish must be disposed of using prescribed government contracting procedures. Furthermore, you must comply with other Service and FDA policies related to the disposition of carcasses and parts that have been treated with chemicals making them unfit for human consumption. Should you have any questions regarding this policy, please contact the Assistant Regional Director, Fishery Resources, through your supervisor.

Attachment

Attachment 22. Use of Anesthetics and Drugs.

IN REPLY REFER TO: AFR

United States Department of the Interior

FISH AND WILDLIFE SERVICE

911 NE. 11th Avenue Portland, Oregon 97232-4181

Memorandum

To: Region 1 Fisheries Project Leaders

From: Assistant Regional Director, Fishery Resources

Subject: Guidance on Clove Oil and Other Fisheries Use Drugs and Chemicals

Hatcheries and other Fisheries offices within Region 1 may at times have legitimate and necessary reasons to use certain drugs and chemicals to achieve their goals and complete the mission and objectives of the Service. During the capture, rearing, or monitoring of fish species, several drugs and chemicals are used for anesthesia, disease treatments, or to increase the survival of the animals. Some of these compounds are already registered and labeled for fisheries use. Others may be legally used under the prescription and supervision of a veterinarian, or within the protocols of an existing Investi~ational New Animal Drug (INAD) exemption permit issued by the Food and Drug Administration (FDA). The Service has existing correspondence (see attached copy) from the FDA concerning the use of compounds in the recovery of threatened and endangered species, but there are certain restrictions even in those situations.

This document is intended to review the use of aquatic animal drugs for Fisheries Projects and provide guidance on their proper use in food animals. Attached are summaries of drugs and chemicals that are approved for aquatic animal use, considered Low Regulatory Priority for use in aquiculture, on the deferred regulatory list for aquiculture, and INAD permitted chemicals. Also attached are the FDA criteria for veterinary extra label use of approved human and animal drugs and a;lossary of terms commonly used by FDA and others involved with the use of drugs and chemicals.

Region 1, working closely with the National INAD Office (NIO) and through appropriate consultation with FDA, will fully comply with all regulations and agreements for the use of aquatic drugs and chemicals. The inappropriate use of compounds on fish or aquatic animals intended for human or animal consumption is

prohibited.

The use of clove oil as an anesthetic in food fish has been declared illegal by the Center for Veterinary Medicine (CVNI) of the FDA. Until notified otherwise by the CVM, a fish is a food fish if it is reasonably likely that it will be consumed directly or indirectly by humans for food. 'Non-food fish salmon, steelhead; or trout are those to be rendered, buried, or released to the wild where they are not subject to harvest in legal fisheries. If a fish to be treated is not a food fish, then clove oil can be used as an anesthetic. However, iuvenile fish cannot be anesthetized using clove oil because of possible residual effects' (this excludes listed fish which are not harvested in legal fisheries as adults). If fish anesthetized with clove oil are rendered, the rendering plant operator who receives the fish must be notified in writing of this treatment; the same is true for MS-222 if its established 21-day withdrawal period is not observed. If the fish is outplanted, the Service must be assured that it will not be harvested in a legal fishery. These situations will be treated on a case-by-case basis and will need written approval from the Assistant Regional Director, Fishery Resources. Please notify your supervisor if you feel you have a non-food fish that would be appropriate for clove oil treatment.

The Service believes that its mission and goals can be achieved within the existing framework of allowable drug and chemical use, but recognizes the pressing needs for additional safe and effective drugs to facilitate recovery and restoration efforts. The Service continues to support the efforts of the National INAD Office, fisheries professionals, and the FDA by supplying data and working towards the registration and labeling of new chemotherapeutic compounds.

Attachment 1: Letter from FDA on the use of dru~s in Threatened and Endangered Species Attachment 2: **Form TE-1, "Guide for ReportinQ Shipment/Receipt of Unapproved Drugs for Use on Threatened and Endangered Fish Species." and Form TE-2, "Chemical Use Log for the Use of Unapproved Drugs on Threatened and Endangered Fish Species."**
Attachment 3: **List of FDA Approved Compounds for Use in Aquatic Animals**

Attachment 4: **FDA Compliance Policy Guide 12=10.4200: Drug use in Aquiculture Enforcement Priorities. Includes the lists of compounds FDA. considers to be of Low Regulatory Priority, Deferred Regulatory Priority, and High Regulatory Priority for enforcement**
Attachment 5: **List of FDA INAD Permitted compounds and their sponsors**

Attachment 6: **FDA Compliance Policy Guide 1240.4210 Extralabel Use of Approved Drugs in Aquiculture**
Attachment 7: **Glossary of terms frequently encountered in chemotherapeutic compound registration and use.**
Attachment 8: **Clove oil fact sheet**

Attachment 9: **FDA Compliance Policy Guide 1240-4260: Classification of Aquaculture Species/Population as Food or Nonfood Animal**
Attachment 10: Use of Unapproved Drugs in Culturing Endangered and Threatened Fish Species (02/06/96)
Attachment 11: Use of Unapproved Drugs in Culturing Endangered and Threatened Fish

`If a drug is not covered by an INAD exemption permit it has no established withdrawal period, or more precisely, the drug must be considered to be present in a residual form into adulthood when it is subject to harvest in a legal fishery. On the other hand, juvenile fish exposed to MS-?22 or drugs under an INAD exemption permit that have an FDA-specified withdrawal time could be stocked immediately following treatment, as this period of time would

Attachment 23. Fisheries Pest Management Policy.

AFR
Memorandum

JA~ -J 2G
To: **Fishery Project Leaders**

From: **Assistant Regional Director, Fishery Resources**

Subject: Fisheries Pest Management Policy

SIGNED BY
DANIEL H. DIG

It is Fish and Wildlife Service (Service) policy to eliminate unnecessary use of pesticides by implementing integrated pest management techniques and by selecting crops and other vegetation that are beneficial to fish and wildlife but do not require pesticides. The ultimate goal is to eliminate pesticide use on Service lands and facilities and to encourage pest management programs that benefit trust resources and provide long-term, environmentally sound solutions to pest management problems on sites which are off Service lands.

When pesticides are used, they must be part of a pest management program that includes strategies to reduce and eventually eliminate their use. The program must be set forth in an Integrated Pest Management Plan which will be a part of the Comprehensive Hatchery Management Plan and must include consideration of target specificity of the pesticide (insecticide, fungicide, herbicide, etc.), risk to nontarget organisms, incidental reduction of food resources for trust species, persistence, control and prevention of the spread of fish and wildlife diseases, and other environmental hazards.

Land management practices must have high value for fish and wildlife resources, not encourage the exposure to pathogens or development of disease vectors. that affect fish or wildlife resources, and they must utilize minimal or no hazardous chemicals.

Internal endangered species review, including~ection 7 consultation, must be completed for all pest management activities that may affect threatened or endangered species.

Service personne1 must be trained in integrated pest management. Those personnel who apply pesticides on Service lands must comply with the provisions of the Federal Insecticide, !.,4L.e-Fungicide and Rodenticide Act and the Endangered Species Act, Department and Service and other applicable laws and regulations. All pesticides must be registered and may o be **used in accordance with the pesticide label. Leftover pesticides, rinse water, and empty; ! a_ containers must be disposed of properly. All personnel involved with integrated pest ari wee management on and off Service lands must participate in medical surveillance on an anriual basis. This program is paid for by the Service from the Field Station budget. Instruction medical surveillance will be issued in a separate memorandum. All pesticides labeled at** 11

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AOP	Annual Operating Plan
BiOp	Biological Opinions
BA	Biological Assessment
BKD	Bacterial Kidney Disease
BP	Burrow's Pond
BPA	Bonneville Power Administration
CBI	Columbia Basin Initiative
CHMP	Comprehensive Hatchery Management Plan
COE	Corps of Engineers
CRFPO	Columbia River Fisheries Program Office
CRiS	Columbia River information System
CWT	Coded-wire Tag
EE	Environmental Education
EIS	Environmental Impact Statement
ELISA	Enzyme-Linked Immunosorbent Assay
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	Ecologically Significant Unit
FDA	Food & Drug Administration
FHC	Fish Health Center
FIS	Fisheries Information System
FNWH	Friends of Northwest Hatcheries
FONS	Fisheries Operations Needs System
FRO	Fisheries Resource Office
HET	Hatchery Evaluation Team
HGMP	Hatchery Genetic Management Plans
HP	Holding Pond
IDFG	Idaho Department of Fish and Game
I&E	Information & Education
IHNV	Infectious Hematpoietic Necrosis Virus
IHOT	Integrated Hatchery Operations Team
INAD	Investigational New Animal Drug
IPNV	Infectious Pancreatic Necrosis Virus
LSRCP	Lower Snake River Compensation Plan
MMS	Maintenance Management System
MOU	Memorandum of Understanding
NF	National Forest
NFH	National Fish Hatchery
NOAA	National Oceanic and Atmospheric Administration, U.S. Dept. of Commerce (also known as NMFS or National Marine Fisheries Service)
NMFS	National Marine Fisheries Service (now known as NOAA-Fisheries)
NPDES	National Pollution Discharge Elimination System
NPT	Nez Perce Tribe
NRCS	Natural Resource Conservation Service
OMB	Office Management and Budget
PAC	Production Advisory Committee
PIT	Passive Integrated Transponder
PTAGIS	PIT Tag Information System
PSMFC	Pacific States Marine Fisheries Commission
RPI	Real Property Inventory
SCS	Spring Chinook Salmon
SDWA	Safe Water Drinking Water Act
Service	U.S. Fish & Wildlife Service (also known as USFWS)
SFBPC	Sport Fishing and Boating Partnership Council

SFH	State Fish Hatchery
SPCC	Spill Prevention, Control and Countermeasure Plan
SS	Setteable Solids
SST	Summer Steelhead Trout
TAC	Technical Advisory Committee
TRT	Technical Review Team
TSS	Total Suspended Solids
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service (also known as Service)